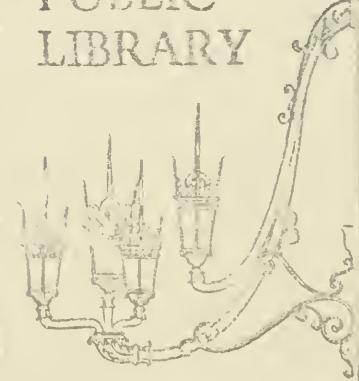


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HEALTH SERVICES

FOR

MASSACHUSETTS CHILDREN

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MASSACHUSETTS STUDY OF CHILD HEALTH SERVICES

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THE AMERICAN ACADEMY OF ARTS AND SCIENCES

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ERRATA

Page 10, Paragraph 5

Acknowledgment is also made of the generous support of The Mason Fund.

Page 91, Paragraph 5

Second sentence should read: "Twenty-three per cent of the births in Massachusetts hospitals occur . . ."

HEALTH SERVICES
FOR
MASSACHUSETTS CHILDREN

BY
LENDON SNEDEKER, M.D., M.P.H.
*Executive Secretary
Massachusetts Study of Child Health Services*

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THE MASSACHUSETTS STUDY OF CHILD HEALTH SERVICES

INTRODUCTORY NOTE

The Massachusetts Study of Child Health Services is part of a nation-wide survey of child health services conducted by the American Academy of Pediatrics. Its findings are here reported and have been combined with those from other states to provide the material for an already published national report. The Study was done in order to ascertain the extent and distribution of existing health services to the children of the state, whether provided by professional men in practice, by hospitals and clinics, or by voluntary and official community health agencies. The facts revealed by the Study in Massachusetts are here presented so that all persons and agencies dealing with children may be informed about existing facilities for the care of children in the state.

There are a good many questions which this report will not answer. That is a fault common to every survey. However the type of information gathered is needed by many organizations throughout the Commonwealth for supporting and planning future health programs. Insofar as it has been possible we have tried to keep the interests of these groups in mind.

Doctors and dentists, whose interests range beyond the confines of individual practice, will gain new insight into their responsibilities for the care of children. Medical and dental societies will find data relating to the distribution, activities, and training of practitioners and the institutions in which they work. Those interested in better health facilities for their communities will find a basis for future planning.

Certain data collected by the Central Office of the Study are not presented here by reason of the fact that they need to be considered in relation to the findings from other states. The need for service has not come within the scope of our inquiry neither has it been our responsibility to set standards for private practice, hospital service, or clinic care. Such matters are the proper concern of the Academy, and not its members in one state. We shall, however, attempt to show existing practices in the state and local variations in the quantity and quality of service.

The findings should be of value to voluntary or governmental agencies, and it is to be hoped that they will, where necessary, form the basis for joint action by both.

JAMES MARVIN BATY, M.D.

Chairman, Massachusetts Chapter, American Academy of Pediatrics

PUBLICATION PROCEDURE AND RESPONSIBILITY FOR THE REPORT

This report has been compiled from material collected in the Commonwealth of Massachusetts. The factual data have been processed in the central office of the Study with the technical assistance of the U. S. Public Health Service and the U. S. Children's Bureau. Further tabulations have been done in the Massachusetts Study office. The report has been written by the Executive Secretary with the advice of the Report Committee, and approved by the Executive Committee for the Study. Those recommendations for action which have been made are to be considered the responsibility of this Massachusetts Committee, and not that of the American Academy of Pediatrics nor of the two participating Government agencies.

The Report has been published for the Massachusetts Study by the American Academy of Arts and Sciences as evidence of its interest in social problems and their solution. It likewise is absolved of responsibility for the opinions here expressed.

ACKNOWLEDGMENTS

This report would not have been possible without the cooperation of a great many individuals whose efforts on our behalf cannot be listed here. A major portion of the work was done by the 4,961 physicians and 2,624 dentists in the Commonwealth who furnished information about their individual practices. The pediatricians among them were our representatives to the more than 200 hospitals and other institutions now being maintained by public or voluntary agencies throughout the state. The health services provided by clinics, schools, and nursing organizations could never have been covered adequately without the cooperation of the Health Officers in the eight Health Districts of the state and especially the help of their Nursing Supervisors and Health Educators.

We are very grateful to the central office of the Study. It outlined clearly the paths we should take. It lent its financial support when we were beginning our work. Finally it dealt patiently with our questions and relieved us of much vital statistical labor.

Financial assistance has been given by the Greater Boston Community Council, the New England Pediatric Society, various county chapters of the National Foundation for Infantile Paralysis, Inc., the Bay State Society for the Crippled and Handicapped, the Charles H. Hood Dairy Foundation, the Theodore Parker Foundation, the Massachusetts Department of Public Health, the Permanent Charity

Fund, Inc., the Sarah A. Hyams Fund, Inc. and the Davies-Rose Company. In addition, we received assistance from the Massachusetts Department of Public Health with rent, furniture, postage, office supplies and equipment. We are also indebted to the Administrator of the Children's Medical Center, Boston, for the courtesy of mimeograph assistance, and to Dr. Harold C. Stuart for providing office space in the Child Health Division of the Center.

Much credit is due to the faithful members of our office force whose cheerful enthusiasm was not erased by the monotony of lists, card files, and form letters: Gloria Cantor, Hannah Jamieson, Patricia Hobbs, and Adele Weisberger; and to Mr. Joseph Chamberlain for his follow-up of the schedules on Boston hospitals. We are also greatly beholden to Mrs. Daisy Jacobs for typing the several manuscripts. The large amount of wifely forbearance and cooperation which this report entailed deserves very special mention.

To all these mentioned above, and to the many others who contributed to this final report, the writer wishes to extend his appreciation and thanks.

LENDON SNEDEKER, M.D.
300 Longwood Avenue,
Boston

CHAPTER I

ORIGIN OF THE ACADEMY STUDY

In 1931 the American Academy of Pediatrics was organized "to foster and stimulate interest in pediatrics and correlate all aspects of the work for the welfare of children which properly come within the scope of pediatrics." Since its founding the Academy has held to these initial principles and in an increasing way has come to make its influence felt for the health and welfare of the nation's children. Not only has the Academy maintained a consistently high scientific standard at its regional and national meetings, but through its official journals it has provided an outlet for pediatric literature of international interest. As the Academy has grown it has become actively interested in many phases of child health work. A few of its twenty-six committees have been created for the transaction of the internal affairs of the Academy, but most of them are responsible for the maintenance of proper medical standards or for lending their influence in the endeavor to improve maternal and child health. Members of the Academy have for many years acted in an advisory capacity to the Children's Bureau.

There are now about 2500 fellows who are members of the Academy. They come from the United States, Central and South America and The Dominion of Canada. All new members must be certified by the American Board of Pediatrics.

On November 10, 1944, the Committee on Postwar Planning presented to the Academy a report which delineated the problems in child health and recommended among other things "that the American Academy of Pediatrics request the United States Public Health Service and the Children's Bureau to undertake with the Academy a survey in every state to determine the present situation with regard to personnel and facilities and what would be needed to meet certain objectives outlined in the report." For a full description of these objectives and the conditions underlying them, the reader is referred to the *Journal of Pediatrics*, Vol. 25, No. 6, Page 625, for December 1944.

The members of the Academy were certain of the need for improving child health. They felt that there was a lack of suitable information with which to plan an intelligent expansion of medical service to children. Many were concerned over the tendency of the Federal Government to take over the conduct of affairs which might be considered more properly the responsibility of local government or of

voluntary health and welfare groups. At the same time there was legislation pending in Congress which threatened radically to change the nature of medical practice. All of these factors tended to obscure an essentially important fact: that for the first time a voluntary association of physicians undertook to make a study of medical service to children and voluntarily sought the cooperation of the two governmental agencies with the necessary national experience and statistical facilities to make such an undertaking practically possible.

The Academy Study was begun in the spring of 1945. By this time the original Committee on Postwar Planning had become the Committee for the Study of Child Health Services. A "pilot study" was started in North Carolina. On the basis of the experience in this state it was possible to improve the original questionnaires and to prepare a manual for use in other states. A central office was set up in Washington to administer the Study under the guidance of the Academy Committee.

Preparation for work in the various states began at the annual meeting of the Academy in February, 1946. At that time the State Chairmen were informed of the part each state would play in the nation-wide effort and the responsibility of each for the conduct of the Study in his state. The central office was to decide the methods to be followed for the distribution and collection of questionnaires; and, following their collection and transmittal to Washington, return to the states tabulated material to be used by them in the preparation of state reports. It was planned to publish a national report of the Study findings and as the project developed state reports were also envisaged. To insure the availability of study data in each state it was decided that, should no report be planned, the information would be made available by the Academy to any responsible agency.

The report of the Academy Study was published in April, 1949.*

*Child Health Services and Pediatric Education, The Commonwealth Fund, New York, 1949.

CHAPTER II

THE MASSACHUSETTS STUDY OF CHILD HEALTH SERVICES—ITS CONDUCT AND LIMITATIONS

HISTORICAL NOTE

This survey is not the first effort to evaluate the health services for children in Massachusetts. The State Board of Health first reported any work with children in 1871, and in 1873 there was published the first report on infant mortality. No attempt was made to survey the situation comprehensively, however, until May, 1917, when, after the First World War, the Massachusetts Child Conservation Committee was appointed to review the agencies in each city and town concerned with the health of children and to make recommendations for their improvement. The White House Conferences of 1930 and 1940 may also be thought of as general efforts in the same field. The report of the Massachusetts State Health Commission in 1935 considered the program then existing for the care of infants and children.

The Massachusetts Study officially began on March 1, 1946, under the leadership of Dr. James Marvin Baty of Boston. Dr. Lendon Snedeker of Boston was appointed Executive Secretary and visited the central office to learn at first hand how the Study was being conducted. He was to take responsibility for the project subject to the control of the State Chairman and an Executive Committee of eleven members.

Before beginning active work, approval for the Study was secured from the Council of the Massachusetts Medical Society, from the Massachusetts Dental Society, and from the New England Pediatric Society.

For a full account of how the Study was carried out in Massachusetts the reader is referred to Appendix A, Page 105.

Limitations of the Study

The schedules used for the Study represent a compromise between the questions one would like to ask and those he might reasonably expect to have answered. Essentially they were designed to show the existing facilities, both personal and institutional, for providing health service to children. Since they give information as to the technical equipment and personnel available to these health facilities, they may be used to measure the quality of medical care. They

show how service is divided between doctors, dentists, pediatricians and the other purveyors of health service.

The National Health Survey of 1935-36 was also a study of existing medical service, but its sources of information were different. Its data were collected by house-to-house canvass of households in selected cities. Lay workers questioned lay recipients of medical care. The present Study questions the individuals and agencies rendering care and answers have been secured by or through professional men acquainted with private practice and with the institutions for which they report.

Since the Study was primarily designed to give a national picture of the existing health services for children it was natural that the data obtained from each state would be tabulated in a manner best adapted to that purpose. Tabulations were done by county for all of the states, and county data were grouped according to their character as *Metropolitan Counties*, *Adjacent Counties* or *Isolated Counties*. This classification has been adopted as being more satisfactory than the usual distinction of urban from rural areas. Counties are classified both according to their population density and their proximity to densely populated areas. By this means recognition is given to the fact that people often cross county lines to obtain medical service in near-by counties, and allowance is given to counties which, though sparsely populated, are nevertheless close to metropolitan counties and their medical facilities. *Metropolitan* counties are those which include the Metropolitan Districts of the Federal Bureau of the Census containing cities of 50,000 or more population. Counties which touch any of the *metropolitan counties* are classified as *adjacent*. Counties that do not touch any part of a *metropolitan county* are termed *isolated*, and are subdivided into those with an incorporated place of 2,500 or more population (semi-rural) and those without such a place (rural).

County groupings applied to Massachusetts tend to conceal certain rural areas in the state. When Metropolitan and adjacent counties are grouped together there remains only one rural area which consists of Barnstable, Dukes and Nantucket counties. This is well shown in the accompanying map (Fig. 1).

By special arrangement with the Central Office of the Study of Child Health Services it was possible to obtain data tabulated by Health Districts. There are eight districts corresponding to the existing administrative areas for public health in Massachusetts. Each of them in addition has one or more important trading or industrial centers and tends to be geographically and economically distinct (Fig. 2). By this means upper Worcester County (District 5) is

COUNTY GROUPS IN MASSACHUSETTS

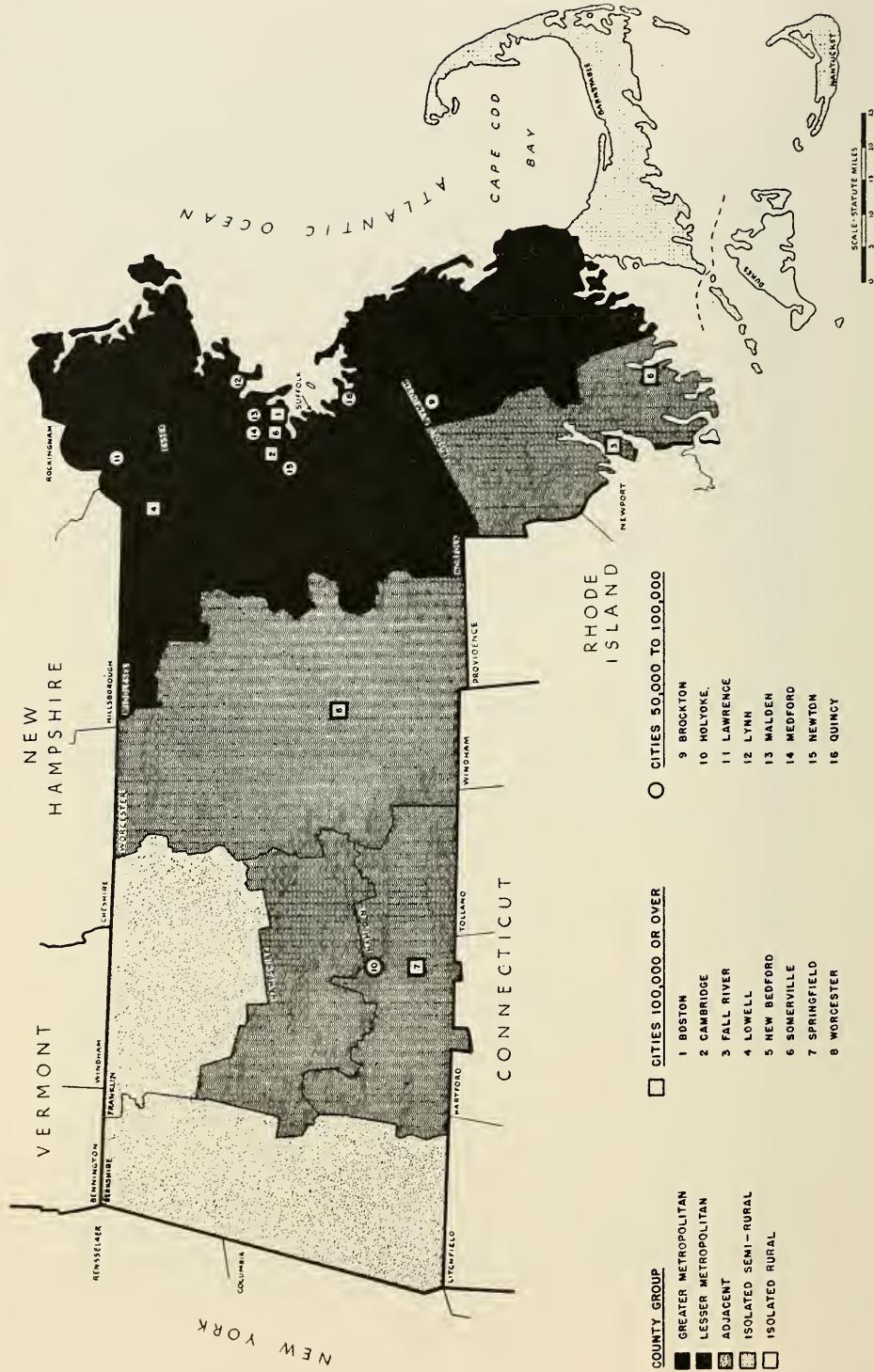


FIG. 1.

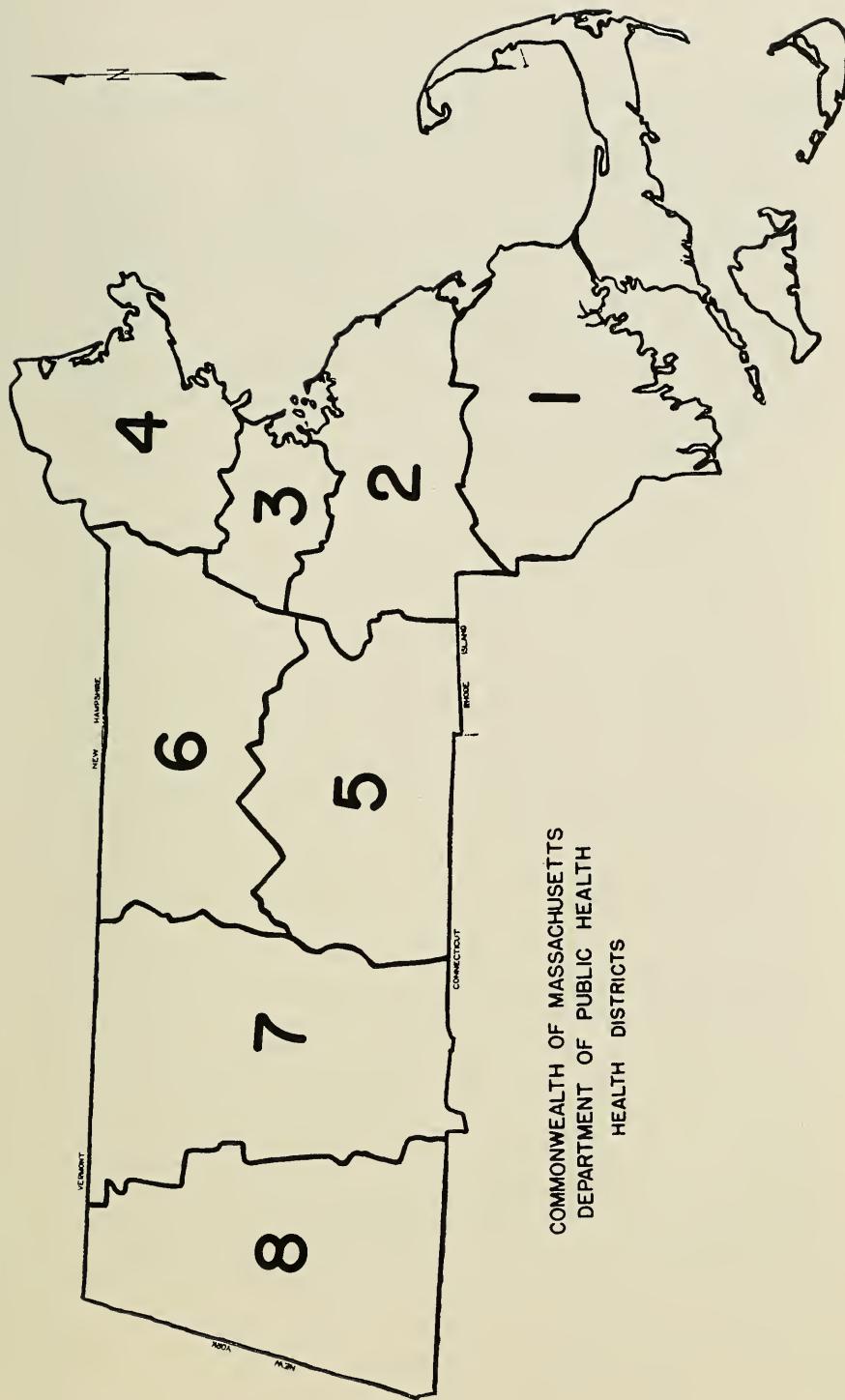


FIG. 2.

separated from the area in proximity to the city of Worcester (District 6) and the comparatively rural southerly halves of Bristol and Plymouth counties are joined to rural Barnstable County.

Tabulations for the Greater Boston Area were also made for the purpose of facilitating the work of a survey committee of the Greater Boston Community Council which was studying facilities for the care of sick children, and developing data which could be utilized by the Greater Boston Community Survey. These are not utilized in this report but have been reported elsewhere.*

* A Study of Facilities for the Care of Sick Children—Report to the Joint Committee of the Greater Boston Community Council and the Greater Boston Community Fund: 1948.

* Greater Boston Community Survey, February 1949.

CHAPTER III

ECONOMIC AND HEALTH SETTING OF THE CHILD IN MASSACHUSETTS

Geographical and Political Considerations

An inquiry into the health of Massachusetts children must take into account certain characteristics which the state shares with other parts of New England. These sometimes limit comparison with other parts of the country. Furthermore county health programs which are operated successfully in other states may not be practical when applied to the many cities and towns of New England.

Massachusetts was developed intensively and in a relatively small area. The unit of government was the town, rather than the county. By the law of the Commonwealth the town is autonomous and subordinate to the state only when the police power is invoked or the common welfare is at stake. Usually the state government may advise, persuade or cajole, but it cannot coerce. Elsewhere in the country the county is usually the unit of government. However in Massachusetts the county is less important functionally. Since the units of government are small, it has often proven difficult to develop successfully plans for the improvement of the public health which are dependent on the cooperation of groups of towns.

The reports of the Study of Child Health Services from those states outside of New England may show striking differences between urban and rural areas. However, in Massachusetts the size of the counties and the fact that nearly all have one or more large centers of population result in the statistical concealment of certain relatively rural areas.

Since county groupings are poorly adapted for revealing localities where health services are comparatively deficient, certain data have been tabulated by health districts. These more adequately delineate rural and urban sections of the state. Furthermore, each represents a distinct geographical area with its own trading and population centers and constitutes an administrative unit of the Massachusetts Department of Public Health. Examples are Berkshire District (District No. 8) with Pittsfield as a trading center, separated by the Berkshire Hills from the rest of the state; or Southeastern District (District No. 1) composed of Dukes, Nantucket, Barnstable counties and portions of Bristol and Plymouth Counties. This is the area roughly corresponding to Cape Cod.

Historical Considerations

Because of its relative age and the early development of its educational institutions, Massachusetts has pioneered in medical research and in the development of public health practices. Examples will be given in the historical notes at the beginning of each chapter of the report.

Child Population

According to the Study of Child Health Services, the following are the numbers of children in certain specific age groups estimated as of July 1, 1945.*

MASSACHUSETTS CHILD POPULATION

All Ages (Under 15 years).....	964,801
Under 5 years.....	375,041
Five to 15 years (approximate school population).....	589,760

In the whole United States 28.3 per cent of the population was under 15 years of age in 1945. Massachusetts was forty-first in rank among the states with 21.8 per cent under 15. The other New England States rank as follows:

	Rank	Per cent under 15 years
Maine.....	21	26.1
Vermont.....	22	25.8
Massachusetts.....	41	21.8
New Hampshire.....	35	23.4
Rhode Island.....	40	22.1
Connecticut.....	43	21.2

Population Density—Urban and Rural Population

Massachusetts has undergone a complete reversal in the character of its population since it was first settled. From 1790 to 1940 the population increased tenfold, from 378,787 to 4,316,721. During that period the urban fraction of the population increased from 13.5 to 89.4 per cent and the rural population decreased from 86.5 to 10.6 per cent. However, the total rural population remained approximately constant.

From 1930 to 1940 the population only increased about 1.6 per cent. Growth occurred in cities of from 10,000 to 100,000 and the

* For method of estimation see Hubbard, J. P., Pennell, N. Y. and Britten, R. H.; *Health Services for the Rural Child*; J. A. M. A. 137: 337-343, May 22, 1948.

larger cities diminished in population. This tendency toward decentralization of the population should be considered in any future plans for the extension of health service.

Whereas over a third of the children (36.5 per cent) of the country live in isolated counties, in Massachusetts only 1.1 per cent are so situated.

Economic Considerations

Since its early days Massachusetts has always provided a high standard of living for its inhabitants. The average per capita buying income* for the United States during 1944 to 1946 was \$1,141. In Massachusetts it was \$1,289.

According to data from the 1940 Housing Census 86.6 per cent of all the dwelling units in the state are classed as urban, 11.2 per cent rural non-farm and only 2.2 per cent rural farm. Even rural farm houses are abundantly provided with so-called "modern conveniences." In all 81.4 per cent have electric lighting, 71.3 per cent have running water and 61.7 per cent have flush or inside toilets.

In 1940 there were 1,534,787 employed workers in the state of which 31.5 per cent were female. There were 8,826 manufacturing establishments which produced goods totalling in value in 1944 \$6,311,146,253. The five most important manufacturing industries are (1) electrical machinery, apparatus and supplies, (2) woolen and worsted goods (3) foundry and machine-shop products (4) boots and shoes (5) cotton goods. This list serves to emphasize the role of Massachusetts as a processor, not a producer of raw materials.

Health Expenditures

Considering its high standard of living and urban character, Massachusetts might be expected to expend relatively large amounts for the health of its populace. In 1948 the health expenditures of the Massachusetts Department of Public Health were \$.93 per capita exclusive of funds for institutional care. The Greater Boston Community Survey for the same year reported an outlay of \$21.12 per capita for all health services, including hospital care, clinic service, and nursing service. This area included half the population of the state.

Births and Birth Rate

The population of Massachusetts is now increasing relatively slowly. There are 80,000-90,000 births a year and slightly more than 50,000 deaths, giving an excess of births over deaths of about 40,000. In

* Sales Management: Vols. 54, 56 and 58; issue No. 10 of each volume.

1946 there were 94,288 births and a birth rate of 20.6 per 1,000. Only 13 of these births were not attended by a doctor and there were only 3 births attended by a midwife. In recent years the percentage of births occurring in hospitals has been steadily increasing. Seventy-eight per cent of all the births in the United States in 1945 occurred in hospitals, which represents a two-fold increase over that in 1935. At present about 97 per cent of Massachusetts mothers have the protection of being delivered in hospitals. Hospitalization occurs less frequently in rural communities and among non-white mothers.

Mortality

The number of deaths in Massachusetts amounts annually to slightly over 50,000. In 1945 there were 51,133 deaths of which 3,327 or 6.5 per cent occurred in children under 15 years of age. These were divided as follows:

Age period	Number of deaths
Under 1 year.....	2,436
1 to 4 years.....	455
5 to 9 years.....	233
10 to 14 years.....	203
 Total.....	 3,327

The death rate per 1,000 population for all ages was slightly higher (11.9 per 1,000) than for the country as a whole (10.8 per 1,000). For the period from birth to 15 years the Massachusetts rates were consistently below the national average. The trend from 1942 to 1945 for births, deaths, maternal deaths, deaths under one year, and stillbirths is shown in Fig. 3.

Maternal Mortality

From 1933 to 1945, the United States and Massachusetts have run an almost parallel course in the downward trend of maternal mortality. There has been a decrease from more than 60 deaths per 10,000 to 20 or less. During the years 1941-1945, Massachusetts ranked twenty-second among the States in maternal mortality with an average rate of 2.1 per 1,000 live births. For the same period the rate for the whole country was 2.5 per thousand.

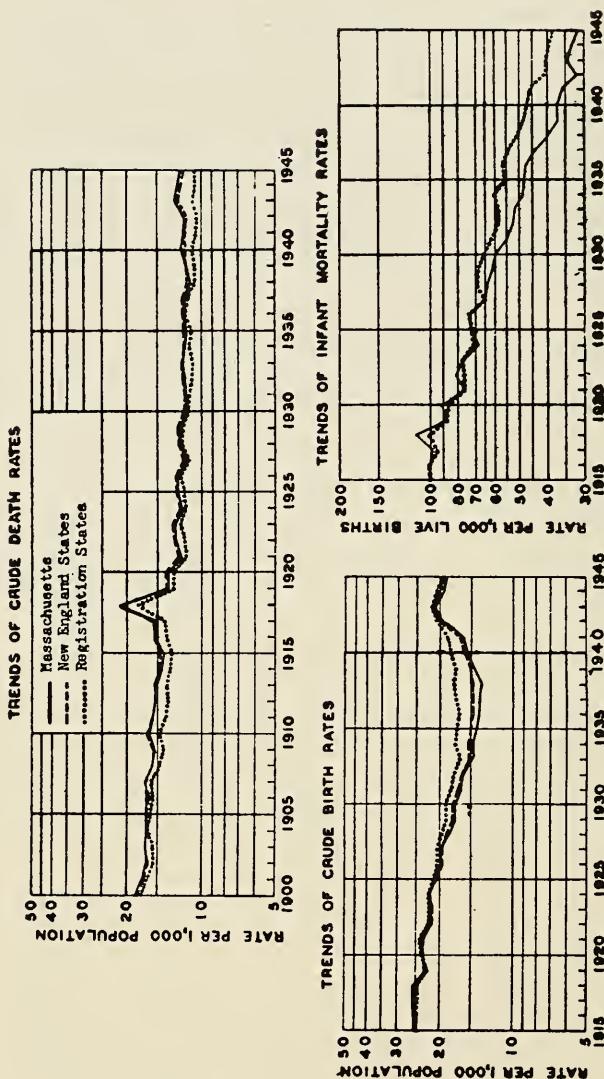
There is very little difference between the mortality observed for mothers in urban as against rural surroundings, but national statistics show a considerable difference between maternal mortality rates for white and non-white mothers. The rate for white mothers is 1.7 per

FIGURE 3.—CRUDE BIRTH AND DEATH RATES, MATERNAL AND INFANT MORTALITY RATES, AND STILLBIRTH RATIOS:
MASSACHUSETTS, 1942-45

(By place of residence. Births and deaths exclusive of stillbirths. Birth and death rates per 1,000 estimated population; maternal and infant mortality rates and stillbirth ratios per 1,000 live births)

Year	Crude birth rate				Crude death rate				Maternal mortality rate		Infant mortality ¹ rate		Stillbirth ratio ²	
	United States ³	New England States ³			United States ⁴	New England States ⁴			Massachusetts	United States	Massachusetts	United States		
		Massachusetts	Massachusetts	Massachusetts		Massachusetts	Massachusetts	Massachusetts						
1945 . . .	19.6	19.3	18.9	10.6	11.8	12.2	2.1	1.8	38.3	31.6	23.9	22.8		
1944 . . .	20.2	19.8	19.3	10.6	12.0	12.4	2.3	1.8	39.8	33.1	24.5	—		
1943 . . .	21.5	21.6	20.9	10.9	12.6	12.8	2.5	2.0	40.4	34.2	24.5	23.4		
1942 . . .	20.9	20.1	19.5	10.4	11.5	11.7	2.6	2.1	40.4	32.0	25.6	24.6		

¹ Deaths under 1 year of age. ² Based on total population including armed forces overseas. ³ Based on civilian population present in area. ⁴ Excludes armed forces overseas, but includes armed forces present in area. ⁵ Includes stillbirths for which period of uterogestation was 5 months or more or not stated.

FIGURE 4.—TRENDS OF VITAL STATISTICS RATES¹—MASSACHUSETTS.

¹Since 1933 the birth- and death-registration areas have included all states in the country.

1,000 live births and for non-white mothers 4.5 per thousand. In Massachusetts however, the difference is much less (1.8 vs. 1.6). In 1945 there were 141 maternal deaths for which the principal causes were puerperal hemorrhages, infections and toxemia.

Infant Mortality

Since 1933 infant mortality in the United States and in Massachusetts has been almost halved. Specifically the rate in Massachusetts dropped from 52 in 1933 to 31.6 per 1,000 live births in 1946. About two-thirds of the deaths in the first year of life occur in the first month.

The following list gives the number of deaths from certain specific conditions operating in the first weeks of life. These are the averages for the annual number of deaths from 1940 to 1945 in Massachusetts:

Prematurity.....	837
Congenital Malformation.....	456
Pneumonia and Influenza.....	328
Birth Injury.....	287
Diarrhea and Enteritis.....	133

Massachusetts ranked twentieth among the states in infant mortality in 1946. The rate was 31.6 per 1,000 live births as against 33.8 for the whole country. For municipal Boston the rate was 34.8 or higher than that for the country as a whole. The chance of survival for white children is considerably greater than for non-whites, the respective rates being 31.3 per 1,000 and 51.6 per thousand.

One-third of the deaths under one year of age are attributable to prematurity, one-fifth to congenital malformations, and about one-tenth to pneumonia and influenza. Birth injury is responsible for 11.2 per cent of all infant deaths. Diarrhea and enteritis, once major causes for infant deaths, are now in fifth place.

Mortality from 1 to 15 years

Since the beginning of the twentieth century there has been a marked reduction in the frequency of certain causes for childhood deaths. Infection and communicable diseases now play a relatively minor role, except in the case of pneumonia and influenza. From one to 15 years accidents are the most important single cause of death and are responsible for about one-third of all fatalities. This is indeed a striking reflection of the hazards to children produced by our mechanized civilization. The following table gives the five leading causes of death for children and infants under one year, one to 4 years, and 5 to 14 years of age. (Fig. 5.)

FIGURE 5.—NUMBER AND PERCENTAGE OF DEATHS FOR THE FIVE LEADING CAUSES OF DEATH IN EACH AGE GROUP, BY RACE: MASSACHUSETTS, 1945
 (By place of residence. Exclusive of stillbirths and of deaths among armed forces overseas)

Age and cause of death	Number			Per cent		
	Total deaths	White	Non-white	Total	White	Non-white
Under 1 year						
All causes.....	2,436	2,371	65	100.0	100.0	100.0
Premature birth.....	781	753	28	32.1	31.8	43.1
Congenital malformations.....	466	466	—	19.1	19.7	0
Pneumonia (all forms) and influenza.....	282	275	7	11.6	11.6	10.8
Injury at birth.....	274	265	9	11.2	11.2	13.8
Other diseases peculiar to first year (161).....	252	242	10	10.3	10.2	15.4
All other causes.....	381	370	11	15.6	15.6	16.9
1 to 4 years						
All causes.....	455	439	16	100.0	100.0	100.0
Accidents excluding motor-vehicle accidents.....	105	101	4	23.1	23.0	25.0
Pneumonia (all forms) and influenza.....	68	68	—	14.9	15.5	0
Congenital malformations.....	40	34	—	8.8	9.1	0
Motor-vehicle accidents.....	36	34	2	7.9	7.7	12.5
Tuberculosis (all forms).....	21	18	3	4.6	4.1	18.8
All other causes.....	185	178	7	40.7	40.5	43.8
5 to 14 years						
All causes.....	436	427	9	100.0	100.0	100.0
Accidents excluding motor-vehicle accidents.....	110	108	2	25.2	25.3	22.2
Motor-vehicle accidents.....	50	49	1	11.5	11.5	11.1
Pneumonia (all forms) and influenza.....	34	33	1	7.8	7.7	11.1
Diseases of the heart.....	33	33	—	7.6	7.7	0
Appendicitis.....	26	26	—	6.0	6.1	0
All other causes.....	183	178	5	42.0	41.7	55.6

CHAPTER IV

TOTAL MEDICAL SERVICE TO CHILDREN

HISTORICAL NOTE

It is impossible to say who was the first pediatric patient in Massachusetts, but it is certain that from the earliest times of the Massachusetts Bay Colony the illnesses of children must of necessity have helped to keep physicians busy. The high incidence of various infections and contagious diseases, and their well known predilection for the young, made the practice of every physician partly pediatric. In 1721 Dr. Zabdiel Boylston first introduced the practice of direct inoculation to prevent smallpox and in 1800 Dr. Benjamin Waterhouse introduced vaccination for the same purpose. Scarlet fever was first observed in the vicinity of Boston in 1735. Other contagious diseases were frequently encountered.

Later special interest in children began to be manifested in other ways. In 1870 the Board of Health was ordered to survey the health of minors employed in the cotton, wool, silk, flax and jute factories in the Commonwealth. Henry P. Bowditch in 1877 reported on the growth of Massachusetts schoolchildren.

It was not until the twentieth century that there began a consistent effort to develop health services for children. A Division of Hygiene was created in the State Board of Health in 1915, and in the following year Dr. Lyman A. Jones was appointed its first Director. In 1920 the state made its first appropriation for a clinic physician to give health service to rural children.

The total medical service available to children in Massachusetts is exceptionally good in comparison with that provided to children in most parts of the country. The rate of medical care, i. e. the number of children under medical care per day per 1,000 children, is 20.3 in Massachusetts, and is exceeded only by Nevada and New York. The average for the whole country is 13.8 per thousand (Fig. 6).

About three quarters of the children receiving medical care on an average day are served by physicians in private practice. The division of service between practitioners, hospitals and clinics is as follows:

CHILDREN UNDER MEDICAL CARE PER DAY PER 1,000 CHILDREN

	United States	Massachusetts
Visited in private practice (office and home).	10.7	15.1
Visited in hospitals.....	2.7	4.4
Visiting clinics.....	0.4	0.8
Total under medical care.....	13.8	20.3

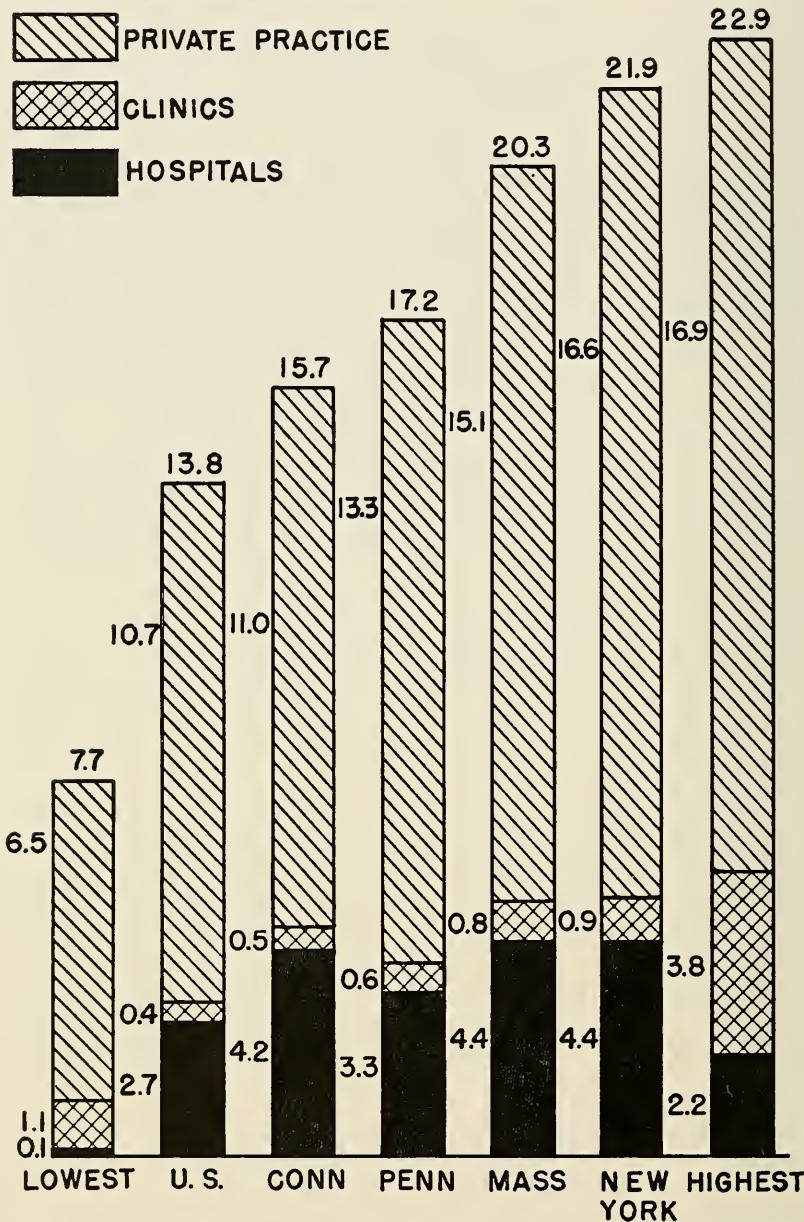


FIGURE 6. Total volume of medical care for children on one day per 1,000 children in Massachusetts: comparison with the United States and selected states.

The preliminary reports of Sisson et al,¹ and the recently published final report of the national study, show states with rates as low as 7.7 per 1,000 children and very marked differences in the rates for county groups within the states. These differences were most marked in the South and Southwest where there are large sparsely settled areas. The distribution of total medical care in Massachusetts is quite uniform by comparison.

Differences between the rates of care in rural areas and those more thickly settled are best shown by using indices based on the ratios of rates in isolated counties to those in metropolitan and adjacent counties.

**MEDICAL SERVICE IN ISOLATED COUNTIES RELATIVE TO THAT IN
METROPOLITAN AND ADJACENT COUNTIES. INDEX—
METROPOLITAN AND ADJACENT COUNTIES = 100**

	United States	Massachusetts
Total volume of service.....	68	86
Visits by general practitioners.....	90	109
Visits by pediatricians.....	20	60
Visits by other specialists.....	39	24
Clinic visits.....	20	51
Hospital days.....	57	56

Children in the isolated counties of the United States receive about one fifth of the pediatric and clinic service provided to children in metropolitan and adjacent counties. They have about half as much hospital care. Children in the isolated counties of Massachusetts receive two thirds the pediatric care, one third the specialist care, and one fifth of the clinic care provided for their counterparts in metropolitan and adjacent areas. They, too, get about half as much hospital service.

Comparisons between the service provided in rural as against metropolitan and adjacent counties in Massachusetts fails to reveal differences between various parts of the state which are classified as non-rural and yet may have rates of care which are lower than rural. The following chart shows the rates for the various health districts per 1,000 children.

Children receive about the same amount of care from physicians except in districts 1, 5 and 7. The attention of pediatricians is least frequent in district 2 and district 6. The rate of clinic care including

¹ Sisson, W. R., Bain, K., Britten, R. H., Pennell, M. Y. and Hubbard, J. P.: "Pediatrics," p. 227, 1948.

MEDICAL SERVICE BY HEALTH DISTRICT

NUMBER OF VISITS PER DAY PER 1,000 CHILDREN

	Visited by all physicians	Visited by Pediatricians	Visiting clinics	Visiting Well-child Conferences	Hospitals	Children receiving health supervision
Whole State.....	15.07	1.70	.83	.42	4.44	4.96
Health District 1.....	12.17	1.10	.37	.33	3.01	3.65
Health District 2.....	15.01	.69	.81	.81	2.66	6.15
Health District 3.....	15.80	2.30	1.24	.50	4.07	5.56
Health District 4.....	16.25	1.59	.18	.11	2.78	4.69
Health District 5.....	13.26	1.57	.22	.14	3.26	3.46
Health District 6.....	15.29	.35	.76	.62	3.46	4.42
Health District 7.....	14.94	2.62	.45	.40	4.04	5.00
Health District 8.....	15.91	1.31	.17	.14	3.56	4.50

that by well-child conferences is particularly low in districts 4 and 8. Hospital care for children is lowest in districts 2 and 4.

About one fourth (24.3 per cent) of the children, other than newborn, in the United States under medical care on a given day were receiving health supervision. In Massachusetts the figure was 29.8 per cent. The division of responsibility for care is shown in the following table. On the whole Massachusetts children receive almost twice as much care as those in the United States.

CHILDREN RECEIVING HEALTH SUPERVISION ON ONE DAY

Services Received ¹	United States		Massachusetts	
	No. per 1,000	Per cent	No. per 1,000	Per cent
Total, exclusive of newborns	2.73	100	4.96	100
From general practitioners	1.82	67	3.40	69
From pediatricians	.68	25	1.05	21
From other specialists	.04	1	.09	2
From Well Child Conferences	.19	7	.42	8

¹Expressed as visits

Both in the United States and in Massachusetts general practitioners furnish about two-thirds of all health supervision for children. Another quarter is rendered by pediatricians, but the proportion of

pediatric care is slightly less in Massachusetts. Well child conferences account for about one tenth of all health supervision.

Nine tenths of the dental care for Massachusetts children is furnished by dental practitioners and one tenth by dental clinics. They have a rate of clinic care three times that for the whole country, which may be due to the large number of children examined under school health programs and referred for treatment to private practitioners. The following table shows how care is shared between dentists and dental clinics and gives rates of care for each:

DIVISION OF RESPONSIBILITY FOR DENTAL CARE: MASSACHUSETTS

	Total visits	Number of visits per day per 100,000 children
Total visits by all practitioners.....	6,230	645.7
General practitioners.....	5,829	604.2
Pedodontists and orthodontists.....	343	35.6
Other specialists.....	58	6.0
Visits to dental clinics.....	715	74.1
Total children receiving dental care.....	6,945	719.9

CHAPTER V

MEDICAL, PEDIATRIC AND DENTAL PRACTICE IN MASSACHUSETTS

HISTORICAL NOTE

Medical practice in Massachusetts may be said to have begun when Deacon Dr. Samuel Fuller landed from the Mayflower on December 21, 1620. His third wife who came to this country on the Anne in 1623 was probably the first midwife in the colonies. A great many of the early practitioners were ministers as well as physicians. Medical facilities for training were meager and at the best consisted in a wise use of the apprentice system. Although Harvard College was opened in 1636, it was not until 1781 that the Harvard Medical School was founded, and with it in the same year the Massachusetts Medical Society. The Medical Practice Act was passed and the Board of Registration in Medicine established in 1894. John Lovett Morse was appointed Chairman of the new Pediatric Section of the Massachusetts Medical Society in 1919 and in the following year a commission was appointed by the Governor to study and report on the high infant mortality observed at that time.

The origins of dentistry in Massachusetts are more obscure. In early colonial times dental practice consisted principally of extractions which were the responsibility of various individuals such as barbers, mechanics, blacksmiths, wig-makers and hairdressers.

American dentistry was transplanted from France and England. Paul Revere, who was a goldsmith and ivory turner by trade, took up dentistry as a side line and advertised in the Boston Gazette and County Journal in 1768 that he was prepared to make false teeth to order. In 1749 Sieur de Roquet came to Boston from Paris, the first of a group of trained dentists. Another early practitioner was John Baker who treated George Washington in 1773. Organized dentistry did not become evident until nearly the middle of the nineteenth century. The first dental society in the United States was formed in New York in 1834, and in 1839 the first dental college was founded at Baltimore. Dentistry for children was a second thought of the profession. In 1927 the American Society for the Promotion of Dentistry for Children was organized, and in 1933 the American Dental Association and the United States Public Health Service jointly made a dental survey of children in 26 states.

The total health service which children receive is rendered by practitioners, by hospitals, and by various community services. However, the doctor and the dentist are the two most important agents providing this service. The training these men receive and

their geographical location will therefore in large measure determine the quality, quantity, and distribution of existing service.

At the time the Massachusetts Study was carried out it was somewhat difficult accurately to know the total number of practitioners in the state and their location. Men were still returning from the Armed Forces and a small proportion were moving to new locations. However 6,139 physicians and 4,486 dentists were sent Study schedules. Seventy-eight per cent of the doctors and 59 per cent of the dentists replied.

Doctors were asked questions concerning the type of practice in which they engaged, their training in pediatrics, and the availability to them of hospital facilities for children. They were serially assigned days of the week and asked to indicate for their assigned day the total number of patients seen, the number of these who were children under fifteen, and the number seen for health supervision.

Pediatricians provided a good deal more information. Each of them was asked to indicate his training, any special field of interest, the availability to him of hospital facilities for children, and the laboratory service at his disposal either in his office or close at hand. In addition each pediatrician kept track of his visits at the office or to hospital and home for a four week period. He also gave the number of children seen by age group and indicated in addition whether the visit was for care in illness or for health supervision. The number of telephone calls per day and the degree to which the pediatrician engaged in outside medical activities such as clinics, hospital rounds and teaching, were obtained.

The data on dentists was similar to that sought for general medical practitioners and each was also assigned a day of the week for which he gave the number of patients seen.

Returns eligible for tabulation were secured from 4,781 physicians, 180 pediatricians, and 2,624 dentists. Child visits on one day were reported by 2,796 out of 4,781 physicians in private practice and by 1,809 out of 2,624 dentists in private practice, 58 and 69 per cent respectively. Statistical adjustments were made for the number of doctors not replying in each section of the state as well as for the season of the year for which they reported.

The information secured is in many ways unique. The characteristics of medical and dental practice, especially with regard to children, have not been well described before. Evidence has been lacking especially with regard to the amount of health supervision provided by medical practitioners.

MEDICAL PRACTICE

Massachusetts ranks second among the states with regard to the number of physicians in private practice. New York is first with one physician for every 636 people and one for every 143 children. Massachusetts has one physician for 855 people and one for every 202 children. For the United States as a whole the ratios are 1 to 1091 and 1 to 308. The figures quoted are for physicians in active practice, and exclude doctors working full-time in institutions or retired or still on active duty with the Armed Forces (Fig. 7).

These figures are somewhat at variance with those obtained by the War Man Power Commission in 1942, which showed that Massachusetts had one physician for every 650 people. Of the 7,713 physicians known at that time 6,972 or 89 per cent were engaged in private practice. Twenty-three per cent limited their practice to a specialty. Suffolk County had the highest proportion of doctors, one for every 286 people, and Bristol County the lowest with one for every 923 people. Since the Massachusetts Study of Child Health Services was conducted in 1946 when a good many physicians were still in active service with the Armed Forces, it might be expected that there would be some difference noted. According to its figures a third of all practitioners were engaged in a specialty. The distribution is shown below:

	Number	Per cent
General Practitioners.....	2,945	61
Pediatricians.....	180	4
Other Specialists.....	1,656	35

Four thousand two hundred and ninety-two or 89.7 per cent of all medical practitioners were living in cities of 10,000 population or over. The proportion of doctors engaged in the various medical specialties is shown in the following table.

DISTRIBUTION OF PRACTITIONERS BY SPECIALTY

	Number	Percentage of all specialists	Percentage of all practitioners
Internists	394	23.7	8.3
Pediatricians	180	9.8	3.8
Surgeons	474	28.7	9.9
Eye, ear, nose and throat	312	18.8	6.5
Orthopedists	73	4.4	1.5
Other Specialists	403	14.6	8.5
	1836	100.0	38.5

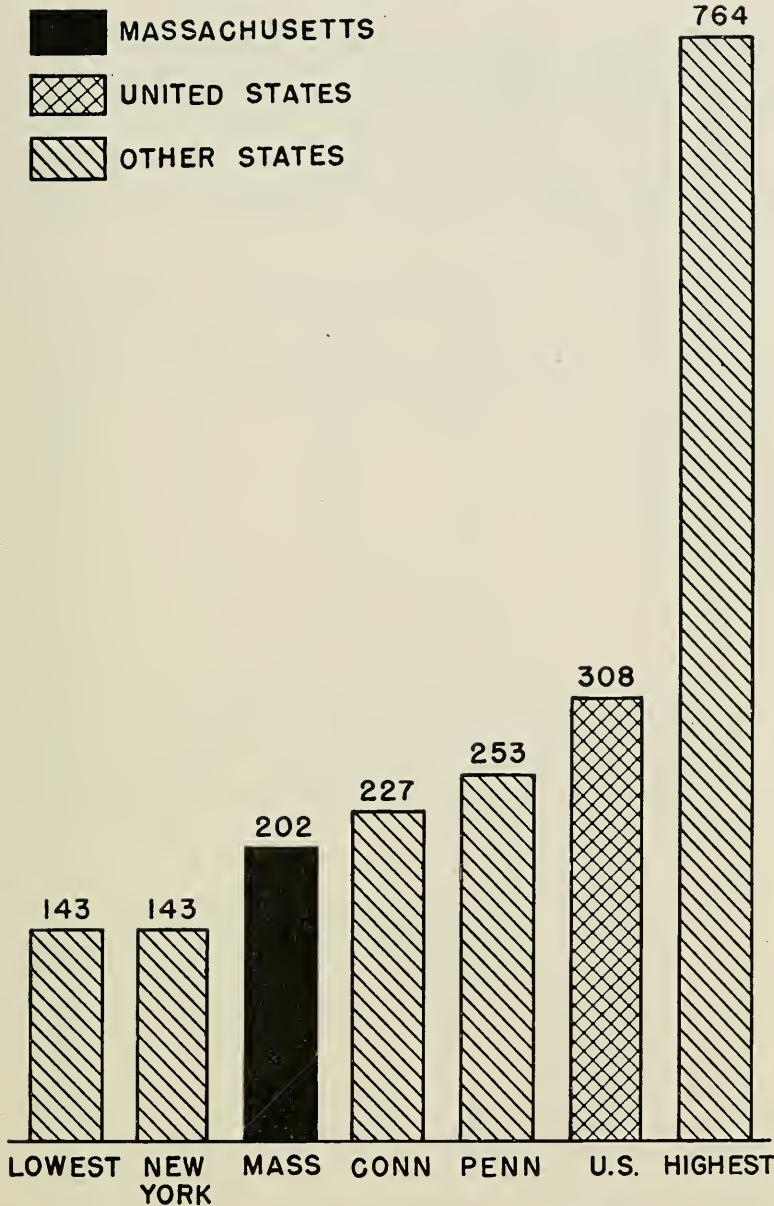


FIGURE 7. Number of children per physician: Massachusetts, the United States, and selected states.

Nearly two-thirds (61.6 per cent) of the doctors available for the care of children are general practitioners and slightly less than 4 per cent are pediatricians. About one-third are specialists in other fields.

Physicians of all types are most numerous in District 3 (Metropolitan Boston) and least numerous in Districts 1 and 6, as the accompanying table shows:

NUMBER PER 1,000 CHILDREN

Health district	All physicians	General practitioners	Pediatricians	Other specialists
Health District 1.....	3.80	2.70	.09	1.00
Health District 2.....	3.88	3.11	.09	.68
Health District 3.....	6.37	3.24	.30	2.83
Health District 4.....	4.31	3.20	.13	.98
Health District 5.....	4.17	2.65	.14	1.38
Health District 6.....	3.59	2.85	.06	.68
Health District 7.....	4.78	2.93	.18	1.67
Health District 8.....	4.74	3.11	.21	1.42
Total.....	4.96	3.05	.19	1.72

Pediatricians and other specialists are most numerous in the Boston area (District 3) and least numerous in Districts 1, 2, 4 and 6.

Eighty-five per cent of general practitioners are in cities of over 10,000, which in 1945 harbored 83.5 per cent of the population. There are no pediatricians in isolated rural areas and only two in isolated semirural areas in Massachusetts.

Sixty-six per cent of general practitioners and 76 per cent of pediatricians are under 55 years of age.

From casual observation one would suppose that there are proportionately more women engaged in pediatric than in general practice. It was actually found that 5.3 per cent of general practitioners and 10.5 per cent of pediatricians are women.

Of the total of 4,781 doctors who answered the questionnaire only ten reported that they were non-whites.

A very considerable proportion of the medical care which children receive is provided by doctors in visits to home or office. The quality of that care will be dependent not solely on the number of practitioners but their distribution throughout the state, their familiarity with children's problems, the training which they have received, and the availability to them of hospitals where they can care for patients who are in need of special diagnostic or therapeutic facilities.

National figures show that about three quarters of the medical care to children is furnished by the general practitioner. The division of responsibility among practitioners for child care in Massachusetts is summarized in Fig. 8 and in the following table.

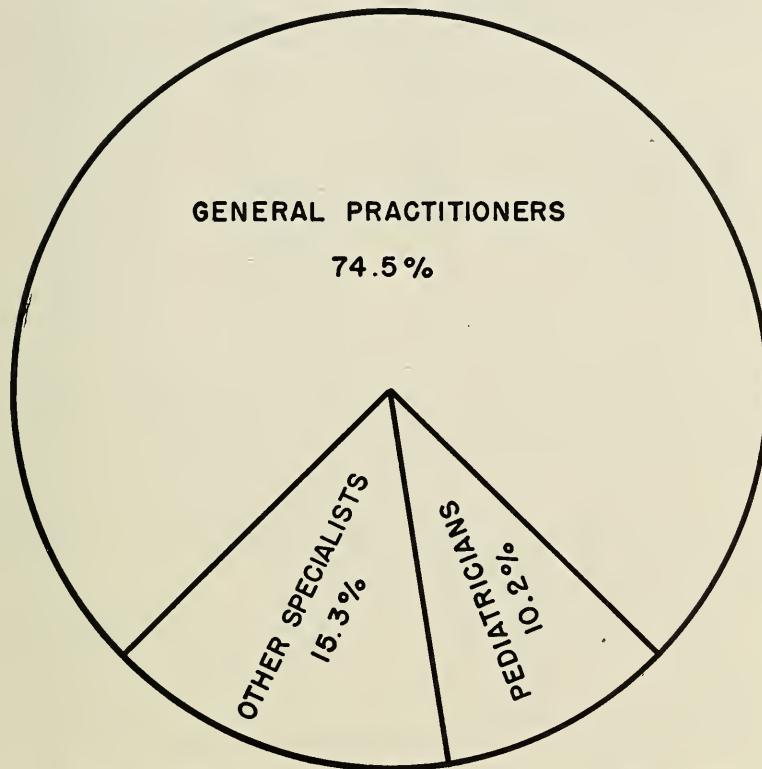


FIGURE 8. Division of child care in private practice—Massachusetts.

CARE OF CHILDREN BY VARIOUS PRACTITIONERS

	Total visits	Per cent of all visits	Per cent of care by specified physicians		
			General practitioners	Pediatricians	Other specialists
For well children	6,818	35.5	73.2	17.8	9.0
For sick children	12,600	64.5	75.3	6.1	18.6
Total for well and sick children	19,418	100	74.5	10.2	15.3

On an average day the physicians in Massachusetts made a total of 19,418 visits to children. This amounted to 4.06 child visits per physician or 20.1 child visits per 1,000 children per day.

PHYSICIANS' VISITS PER DAY PER 1,000 CHILDREN

	Total	Sick care	Health supervision
Health District 1.....	18.1	11.6	6.5
Health District 2.....	19.6	11.7	7.9
Health District 3.....	20.8	13.4	7.4
Health District 4.....	20.9	14.2	6.7
Health District 5.....	17.6	11.6	6.0
Health District 6.....	20.0	14.2	5.8
Health District 7.....	21.0	12.9	8.1
Health District 8.....	23.0	16.1	6.9
Total.....	20.1	13.1	7.0

The rate of total visits by physicians is lowest in District 5. Roughly speaking the rates for sick care are twice those for health supervision. The lowest rates for health supervision were observed in Districts 5 and 6.

Care to children constitutes almost one-third of the practice of the general practitioner. Of 18,984 reported visits to patients of all ages 30.8 per cent were made to children under 15 years of age. Much of this time is spent in providing health service.

For the country as a whole, 26 per cent of the care provided by the general practitioner to children is for health supervision. Over twice this amount is furnished by pediatricians (54 per cent). In Massachusetts, general practitioners devote 33 per cent and pediatricians 62 per cent of their time with children to health service (Fig. 9).

DAILY VISITS BY PRACTITIONERS

Average number of visits per day	General practitioner	Pediatrician
Sick child.....	3.2	4.3
Well child.....	1.7	6.7
Adult.....	10.3	.3
Total.....	15.2	11.3

Nearly half of all visits to children are office visits and over three-quarters are made to home and office together. The distribution of 6,317 recorded visits is shown in the table following Fig. 9.

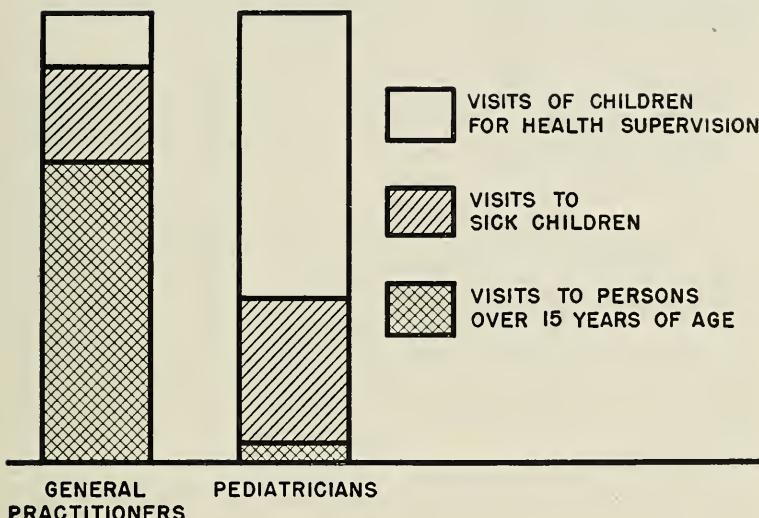


FIGURE 9. Proportion of practice devoted to health supervision by general practitioners and pediatricians—Massachusetts.

LOCATION OF VISITS BY PRACTITIONERS

	Rate per 1,000 children	Per cent
Office.....	9.5	47.3
Home.....	5.6	27.8
Hospital.....	5.0	24.9
Total.....	20.1	100.0

Hospitals admitting children are generally easily available throughout the Commonwealth. Of 1,597 physicians, all but 13 reported that there was such a hospital in the same town, or within less than 25 miles of their offices. However 19 per cent of the physicians reporting said they were not permitted to care for their child patients in the nearest hospital. Hospital privileges with respect to children are more restricted in the densely populated areas of the state. In greater metropolitan counties 21 per cent of the physicians did not have hospital privileges with regard to their child patients.

About one-third of general practitioners carry out major surgical procedures on children. Nearly two-thirds customarily do tonsillectomies. About 80 per cent see children for regulation of feeding.

The following table shows the type of procedure reported by 1,470 general practitioners.

	No. of physicians	Per cent
Doing major surgery.....	482	33
Doing tonsillectomies.....	757	51
Regulation of feeding.....	1,159	79

A total of 1,259 physicians reported some participation in child health activities in the course of a month. One hundred and sixty-eight physicians (13 per cent) had worked an average of 10.4 hours per month in well-child conferences. One hundred and fifty-seven physicians were engaged in school health services and had served an average of 20.7 hours each. Nearly one-third (363) had spent an average of 25.5 hours in other medical activities, principally ward rounds.

Data were available from 1,607 general practitioners with regard to the kind of medical training they had received. One hundred and fourteen or 7.2 per cent had had no hospital training whatever. Three-quarters of these were over 45 years of age. Forty or 2.5 per cent had had less than one year of hospital training. Four hundred and sixty physicians had had one to two years of hospital training. About 50 per cent of these had had two or more years. However over one-third have had less than a month's hospital training in pediatrics and slightly less than a third (488) had had no postgraduate training in pediatrics. Those men who had had more than one year of hospital training were found to be making 85 per cent of all the visits to children.

HOSPITAL TRAINING OF GENERAL PRACTITIONERS

Hospital training	All ages	Under 45	45 to 64	65 or more
None or less than one year.....	12.9 %	6.6 %	9.3 %	35.8 %
One year or more:				
None or less than one month in pediatrics	32.0	20.8	41.6	39.5
One month or more in pediatrics.....	55.1	72.6	49.1	24.7
	100.0	100.0	100.0	100.0

PEDIATRIC PRACTICE

Hubbard and Zibit* of the Academy Study have already reported national data secured from 3,487 pediatricians in the United States.

* Hubbard, J. P. and Zibit, S.; *Pediatrics*, March 1948.

(A pediatrician is defined as any one who calls himself such without regard for any official certification.) Of this number 180 or 5.3 per cent are located in Massachusetts and serve 2.7 per cent of the total United States population. Massachusetts ranks second in the country as regards the number of children per physician (1 : 202) but fifth as regards the number of children per pediatrician. There is one pediatrician for each 5,360 children as compared with a national figure of one per 10,299.

Pediatricians tend to be younger than physicians in general. The median age for Massachusetts pediatricians is 45 years and 76 per cent are under 55. Eighty-nine and one-half per cent are males. There were none who were reported as non-white.

Forty-four per cent of the practicing pediatricians in the country are members of the American Academy of Pediatrics. Fifty-one per cent of pediatricians, including those from Massachusetts, are certified by the American Board of Pediatrics.

As would be expected for any group of medical specialists, pediatricians have had more hospital training than the average doctor. Sixteen per cent of the general practitioners in the country have had no hospital training whatever, and 46 per cent have had no pediatric training, whereas only two per cent of the pediatricians are without hospital training and 27 per cent without pediatric hospital experience. One-half of the pediatricians have had more than two years of hospital training.

In Massachusetts two of 143 pediatricians reported having had less than a year's hospital training and 31 had had less than a year's training in pediatrics. Thirty-seven per cent had had more than two years of hospital training.

Relatively few practicing pediatricians in Massachusetts specialize within their field. There were nine in allergy, four in psychiatry, and eight in cardiology. Nearly one-half cared for their patients when minor surgery was involved, but only one-tenth did tonsillectomies or cared for fractures.

Seventy-five per cent of the nation's pediatricians are located in cities of 50,000 or more population. Ninety-seven per cent of those in Massachusetts live in cities of over 10,000 (83.5 per cent of the population). There are only two of them situated in the isolated counties of the state.

The average pediatrician in the country sees about 16 patients a day or 500 per month. Occasionally he may report as many as 85 child visits a day. For 180 Massachusetts pediatricians the maximum number of visits reported was 57. There were three pedia-

tricians reporting 32 visits per day but the average was 15.7 visits. These are divided as follows:

DAILY CASE LOAD OF PEDIATRICIANS

	Number of visits per day
Office visits.....	5
Home visits.....	3.2
Hospital visits.....	1.2
Visits for health supervision.....	6.3
Total.....	15.7

Another item of service, untabulated but none the less an important and time consuming factor in the life of every pediatrician, is the number of telephone calls for advice and consultation. These averaged 8.7 per day.

Massachusetts pediatricians seem well equipped to handle the routine problems encountered in practice. There is no pediatrician in the state who does not have a hospital within a 25 mile radius to which he can send his child patients. In many localities, the distance is very much less than this. One hundred and forty-three pediatricians reported on the availability of laboratory service for office patients. Eighty-seven per cent could do blood counts and 97 per cent urinalyses in their own offices. Only about 14 per cent reported that they could provide blood chemistry, throat cultures, x-rays, fluoroscopy, or electrocardiograms. However, the others indicated that such facilities were easily available.

Information was secured about the attitudes of pediatricians toward prepayment for medical service. Twenty-one per cent of all pediatricians in the United States and 18 per cent of those in Massachusetts have had some experience with prepayment plans. About 40 per cent in both groups were opposed to prepayment.

DENTAL PRACTICE

Massachusetts stands first among the states with respect to the number of children under dental care. It has twice as many children under care as the country at large or 7.2 per 1,000 children compared with a national rate of 3.3 per 1,000. New York is second with a rate of 6.9. There are 368 children per dentist in Massachusetts but 548 per dentist in the whole United States (Fig. 10). On an average day there are 6,945 children receiving some form of dental care.

In the whole country about 25 children are attended by private

practitioners to every one attending dental clinics. In Massachusetts, however, there is proportionately more clinic care and the ratio is only nine to one. This is probably due to the large number of children examined under school health programs and later referred to private practitioners. There is relatively little difference between county groups with respect to care by private practitioners. However, the isolated counties of the state have a rate of .56 children per day per 1,000 for clinic care contrasted with a rate of .74 in the balance of the state. Whether children in isolated counties need more provision for clinic care should be investigated.

Two thousand six hundred and twenty-four dentists or about 59 per cent of the total list answered the study questionnaire. Ninety-seven per cent of these (2,534) were general dental practitioners. There were only two dentists who said they specialized in children's work and 42 orthodontists, 11 of whom were certified by American specialty boards. Two hundred and forty-five dentists in Massachusetts did not report whether they limited their practice to a specialty and were therefore assumed to be general practitioners. The other specialists included 29 in oral surgery, 6 in periodontics and 11 in prosthetics.

Of 2,534 dentists reporting over half or 57.5 per cent were over 45 years of age. Only 13.5 per cent were under the age of 35. There was a total of 1,469 dentists over 45 years of age. The percentage of older dentists throughout the state was relatively uniform and similar to the rate for the state as a whole, with the exception of Barnstable County where there were 88.5 per cent over that age.

Out of 2,534 dentists 2,508 or 99 per cent were men. Only 26 were women practitioners.

Practically all dentists reported that they saw children under 15 in their practices and only sixty-eight said they only saw them under emergency conditions or when extractions were indicated.

Over 90 per cent (2,407) of all the dentists and all the orthodontists in the state live in cities with more than 10,000 population. In the three isolated counties there are only 30 general practitioners of dentistry and no dental specialists. Dentists are not uniformly distributed within the state. In Metropolitan Boston (Health District 3) there are 3.6 per 1,000 children. Out on Cape Cod (District 1) and in the lower half of Worcester County (District 6) the rates are 1.8 and 1.6 per 1,000.

General practitioners, who constitute 97 per cent of all Massachusetts dentists, furnish 93.6 per cent of all visits to children. Pedodontists and orthodontists provide 5.5 per cent.

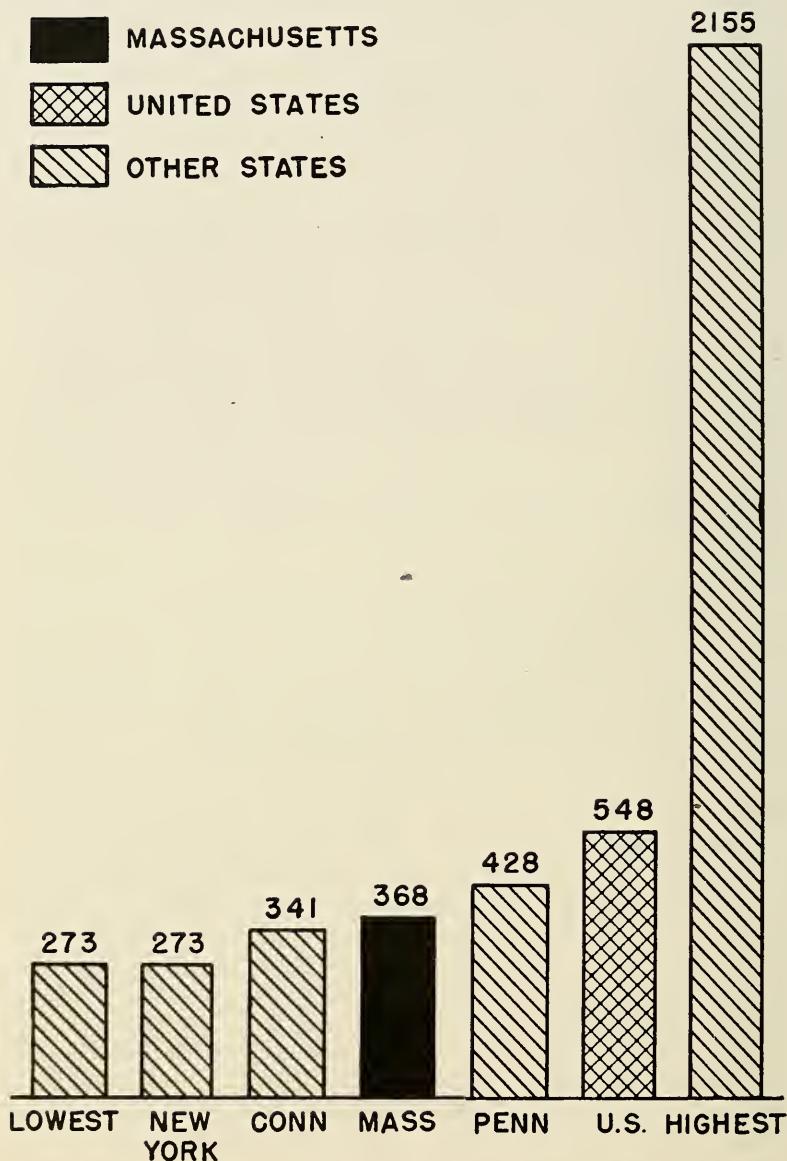


FIGURE 10. Number of children per dentist: Massachusetts, the United States, and selected states.

DISTRIBUTION OF DENTISTS BY HEALTH DISTRICT

	Total	Rate per 1,000 children		
		General practitioners	Pedodontists and Orthodontists	Other specialists
Health District 1.....	1.82	1.78	.02	.05
Health District 2.....	2.52	2.47	1.90	.02
Health District 3.....	3.57	3.41	.08	.08
Health District 4.....	2.30	2.28	—	—
Health District 5.....	2.28	2.19	.05	.05
Health District 6.....	1.58	1.57	—	.01
Health District 7.....	2.64	2.54	.04	.05
Health District 8.....	2.38	2.31	.04	.04

When rates of dental care to children in the various health districts of the state are compared, it is found that the average for the state is 6.5 children per day per 1,000 children. District 3 (Metropolitan Boston) has the highest rate, 7.9. Rates under 5 are reported for Districts 1, 6, and 8, all of them comparatively rural.

About one-quarter of the dental care furnished in the state on an average day is received by children under the age of fifteen of whom a fourth are less than six years old.

Eighty per cent of all dentists' hours are devoted to people over 15 years of age and only 4 per cent to children less than 6 years old. If the amount of dental attention that Massachusetts children receive is measured in terms of the total number of services rendered (extractions, fillings, and other services), the same proportion of service is found.

About half (53 per cent) of the dentists in the state have an office assistant. About one-quarter have no assistance in the office, and slightly less than one-fifth employ dental hygienists.

One thousand two hundred and forty-one dentists reported on all their dental activities during a previous month. The total dental hours were 197,523 of which 97 per cent were spent in private practice.

Approximately the same number reported on hours spent in the preceding month on activities other than private practice. Six hundred and fifty, or about one-half, had participated during this time in pre-school or school dental services and had furnished a total of 2,083 dental hours. Seven hundred and twenty-three had participated in other dental activities for a total of 2,928 hours.

Only half of the 1,735 dentists reporting have had any training in pedodontics. Training in the care of children is more frequently reported by older practitioners. Fifty-eight per cent of dentists

under 45 years of age report no training in pedodontics whereas 45 per cent of men over 45 are without such training. However this group provides 45 per cent of the dental service to children. Since over half the dentists reporting have stated that they had no training in children's dentistry, it is apparent that attempts to improve dental care for the children in Massachusetts should be focussed on the education of the general dental practitioner.

CHAPTER VI

THE CONTRIBUTION OF THE HOSPITALS

HISTORICAL NOTE

In the early days of the colonies the hospitals first established were institutions for the care of persons suffering from such contagious diseases as smallpox. The earliest of these in Massachusetts was erected in 1716 and located on Spectacle Island in Boston Harbor. It was not until the early nineteenth century that there began to be developed institutions for the general care of the sick, many of which were to become the University teaching hospitals of the present day. Among the first of these were The New England Hospital for Women and Children and The Massachusetts General Hospital. The latter was founded in 1811 and first opened a separate ward for children in 1902. The Boston City Hospital next opened its doors in 1858 and the Children's Hospital was incorporated in 1869. The Massachusetts Memorial Hospitals opened a children's ward in 1884. Mention should also be made of the Boston Floating Hospital whose daily trips in Boston Harbor during the summer months beginning in 1894 meant the indoctrination of a whole generation of American pediatricians in the principles of infant care. When the ship was burned in 1927 its "On-Shore Division" carried on and is now associated with Tufts Medical School as an integral part of the New England Medical Center. At the present time these two institutions, plus the North Shore Babies Hospital, constitute the three pediatric hospitals in the Commonwealth.

Massachusetts was one of the first states in which the state department of health controlled the licensing of hospitals. This began in 1941, but in July 1948 a Division of Hospitals was created with authority to inspect and license all institutions caring for the sick, viz. hospitals, sanatoria, convalescent and nursing homes and homes for the aged.

The facilities for the care of newborn infants have greatly improved during the present century. In 1915 the infant mortality in Massachusetts was 101. By 1946 this had been cut to 31.6 per 1,000 live births. In the city of Boston the rate dropped from an average of 137.8 during the period 1901-1905 to 35.5 in 1946. This significant reduction in the loss of infant life was brought about through the creation of a variety of agencies.

The first investigation of infant mortality in the state was made in 1873. In 1832 the Boston Lying-In Hospital was founded and in its long career has made significant contributions to the improvement

of maternal and neonatal care, and through an expanding teaching program has carried the concepts of superior obstetric care well beyond the confines of Boston. In 1937 the Massachusetts Medical Society through a special Committee began a program for the reduction of maternal mortality through the investigation of maternal deaths and the teaching of improved obstetrics to the physicians in the Commonwealth. In the same year, with the realization that prematurity was the most important single cause of infant deaths, the Massachusetts Department of Public Health began an intensive prematurity program. Forty-eight premature centers were established and provision made for giving special instruction in premature care to nurses.

The Massachusetts Study included in its scope an inquiry into the existing hospital facilities for the care of children. This involved not only an enumeration of the available hospital beds in the state and the number of child admissions per year, but was concerned with the facilities provided by hospitals which might be related to the quality of the care rendered to children.

A distinction was made between the services rendered by general hospitals and those furnished by special hospitals or institutions giving convalescent and chronic care. The latter will be considered in another chapter of this report.

Not all the general hospitals in the state were included in the Study. Those having less than five beds were not considered, neither were federal hospitals such as those operated by the Army or Navy, the United States Public Health Service or the Bureau of Indian Affairs. Homes for the feeble-minded were excluded, when they were concerned only with providing custodial care, and no attempt was made to secure data from foster homes or nursing homes which are licensed in the state as Homes for the Aged and rarely admit children.

Data were secured on 186 institutions of which 151 were classified as general hospitals. Of the 151 general hospitals 139 admitted maternity cases and 140 admitted children. Included as general hospitals are seven maternity hospitals and three pediatric hospitals.

Only three of the 151 general hospitals were situated in isolated counties. These provided 125 or 0.7 per cent of the 17,545 beds in the Commonwealth for about one per cent of the population.

Consistent with its urban character and large per capita income, Massachusetts ranks high among the states with regard to hospital facilities for children. It is fifth with respect to the number of beds, third in number of children's beds and ninth in number of child admissions per 1,000 children. One twentieth of the 43,084 hospital beds for children in the United States are maintained in Massachusetts.

The following table shows the situation for the United States, Massachusetts and certain selected states. Figures are also given for the highest and the lowest state.

HOSPITAL FACILITIES FOR CHILDREN, 1945 AND 1946
THE UNITED STATES AND CERTAIN SELECTED STATES

State	Number per 1,000 children		
	Total beds	Beds reserved for children	Annual child admissions
United States.....	12.8	1.20	51.4
Highest state.....	28.5	2.40	97.3
New York.....	19.8	2.17	65.5
Massachusetts.....	18.2	2.25	71.4
Connecticut.....	16.8	2.05	67.0
Pennsylvania.....	15.1	1.80	56.0
Lowest.....	5.5	.21	25.6

There are 140 general hospitals in Massachusetts caring for children. There are 72 hospitals with pediatric units of 5 or more beds and also three hospitals admitting children only. These are The Children's Hospital, The Boston Floating Hospital, and The North Shore Babies Hospital. These three pediatric hospitals provide 444 beds or one-fifth of the 2,167 pediatric beds in the Commonwealth.

For the whole state there are 17,545 total beds or 18.2 beds per 1,000 children. Thirteen thousand six hundred and seven beds are in hospitals having pediatric units. Thirteen per cent of all the beds in the 72 hospitals with a pediatric unit (exclusive of the three pediatric hospitals) are for children only. Children's beds represent 12.4 per cent of the total general hospital beds.

Ninety per cent of the general hospitals in Massachusetts admit children or newborn infants and are in or near urban areas. Forty per cent are in or near Boston. Pediatric beds are provided in the ratio of 2.2 per 1,000 children. More than half of these are situated within a 25 mile radius of Boston.

There is a considerable disproportion between the number of beds available for children in isolated counties and in the state as a whole. General hospital beds per 1,000 children in the three isolated counties in Massachusetts number 11.6 against 18.3 for Metropolitan and adjacent counties. The number of pediatric beds is 0.5 per 1,000 or about one-fifth as great as the number in the whole state.

During the report year there were 68,878 child admissions to Massachusetts hospitals or an admission rate of 72 per 1,000 children. There were four child admissions per bed. However there were 26

admissions per year to beds reserved for children. Nearly three-quarters (73.9 per cent) of the children concerned were admitted to hospitals of 100 or more beds. Only two per cent of child admissions occur in hospitals of less than 25 beds. Eighty-six per cent of all admissions are to hospitals with pediatric units.

ADMISSION OF CHILDREN TO HOSPITALS BY SIZE

Hospital size:	Number of hospitals	Number of beds	Per cent of child admissions	Child admissions per bed per year
5-24 beds.....	18	337	1.9	4.0
25-29.....	77	3,974	23.1	4.0
100-249.....	43	7,140	42.4	4.1
250 or more.....	13	6,094	32.6	3.7
	—	—	—	—
Total.....	151	17,545	100.0	3.9

Children's beds may not be utilized with the greatest possible efficiency. Good hospital practice would mean an occupancy rate of 80 per cent. The Study data indicate that pediatric beds are occupied to about 62 per cent of their capacity. Rates as low as 45 per cent have been noted for certain municipal hospitals. Attention should be directed to the full utilization of already existing children's beds before planning the construction of new facilities. An exception would be the smaller hospitals, whose need for children's beds is irregular and where the service rendered is apt to consist principally of admissions for traumatic surgery, for tonsillectomies and for an occasional acute illness.

The 151 hospitals in the state are divided according to ownership as follows:

HOSPITAL USE BY TYPE OF INSTITUTION—MASSACHUSETTS

Type	Number of hospitals	Admissions per child bed per year	Child admissions per bed per year	Days care per patient
Non-Profit.....	101}	34.0	4.5	7.9
Proprietary.....	35}		3.7	10.8
Municipal.....	15	19.6	2.6	10.6

Non-profit hospitals provide nearly three-quarters of all the general hospital beds (71 per cent) and about the same percentage of pediatric beds. They also account for 78.9 per cent of all child

admissions. Non-profit and proprietary hospitals together report about 34 admissions per child bed per year contrasted with 19.6 for the 15 municipal hospitals. This is consistent with the usual experience that governmentally operated institutions are more apt to receive long-term cases.

Proprietary hospitals provide more days of care per patient (an average of 10 days) than do non-profit hospitals (7.9 days). Most of the proprietary hospitals are in the eastern part of the state and half of them are in the Greater Boston area. Although municipal hospitals have 21.5 per cent of all the beds and 23.4 per cent of the pediatric beds, they care for only 14.2 per cent of all child admissions.

It is only partly informative to say that Massachusetts has a relatively high proportion of children's beds. The quality of care received is likewise important. While this is largely dependent upon the number and kind of nurses and doctors available, the type of equipment and personnel is a rough and presumptive measure of the quality of service. The survey therefore inquired into the frequency with which certain characteristics were observed in hospitals.

CHARACTERISTICS OF MEDICAL CARE IN HOSPITALS OF VARIOUS SIZE

	Small general hospitals (18 total) 5-24 beds		Large general hospitals (133 total) 25 or more beds		Hospitals with pediatric units (75 total)	
	No.	%	No.	%	No.	%
Registered by A.M.A.	8	44.4	117	88.0	71	94.7
X-ray service in hospital....	16	88.9	133	100.0	75	100.0
Clinical lab.	6	35.3	110	83.3	72	96.0
Separate pediatric unit.	—	—	75	56.4	75	100.0
Separate ward for infants other than newborn.	—	—	46	34.8	46	62.2
Any house staff.	—	—	55	45.1	44	63.8
Graduate nurse on duty at all times in pediatric unit.	—	—	56	43.1	56	77.8
Qualified dietitian.	—	—	96	75.6	66	90.4
Selected clinical lab. services available.	—	—	96	75.6	70	95.9

Only 44 per cent of the small general hospitals of 5-24 beds were registered by the American Medical Association. Larger general hospitals were 88 per cent registered, and hospitals with pediatric units 95 per cent. Ninety-six per cent of the 75 hospitals with pediatric units had clinical laboratories on the premises, but only one-third of the smaller hospitals were so equipped. Only about one-third of the general hospitals of 25 or more beds had a separate ward for

infants other than new-born infants, but nearly two-thirds (62 per cent) of the hospitals with pediatric units provided separate facilities. Less than half of the large general hospitals had a graduate nurse on duty at all times in the pediatric unit, but over three-quarters of the hospitals with pediatric units were able to provide this type of supervision. Nearly all hospitals used pasteurized milk. Ninety per cent of the hospitals with pediatric units had a qualified dietitian on the staff.

Seventy-five per cent of the large general hospitals could provide clinical laboratory services but over 95 per cent of hospitals with pediatric units had them. These included facilities for doing routine bacteriology, biochemistry and hematology. The degree to which these facilities are at hand determines in no small measure the capacity of the hospital to function adequately as a diagnostic center and a place where treatment can be administered under adequate control. Hospitals with a pediatric unit would appear to be generally more adequately staffed and equipped.

A considerable number of children are admitted to hospitals which do not provide certain types of service. For example about 35 per cent of child admissions occur in hospitals where there is no graduate nurse in charge of the pediatric unit. In 36 per cent, infants other than newborn are not segregated from older children in a separate nursery. Experience shows that there is probably a considerable risk from intercurrent infection in this age group. The following table shows the frequency with which child admissions occur in hospitals with certain of these characteristics:

General hospitals having	Per cent of child admissions to hospitals (25 or more beds) with specified characteristic.	
	U. S.	Mass.
Separate wards for infants other than newborn	54.3	64.5
House staff	62.5	74.8
Graduate nurse on duty at all times in pediatric unit	62.7	69.0
Separate pediatric unit	76.0	89.0
Trained dietitian	80.4	91.5
Selected clinical laboratory services	81.1	94.7
Clinical laboratory	89.9	95.5
Average	72.4	82.8

Special personnel such as internes and graduate nurses in charge of units are only apt to be available in larger hospitals where train-

ing programs are under way. Much as it would be desirable to have certain personnel, it is impractical under present circumstances for many hospitals either to support training programs for nurses or to provide opportunities sufficiently attractive to young doctors. It is of course not implied that all hospitals should make the same provision for children, but rather that the function of the institution should be governed by the kind of staff and equipment it possesses. In general the small proprietary hospital is extremely limited with respect to its capacity for serving children. However this type of institution has relatively few pediatric admissions.

Hospital Care of Newborn Infants

The care of newborn infants in Massachusetts is a hospital problem. In 1946, 82.4 per cent of the births in the United States and 97.2 per cent of those in Massachusetts occurred in hospitals. Connecticut was first (98.9 per cent) and Massachusetts fourth in the national ranking. Since 1935 the frequency of hospital confinement has increased markedly, more than twice for the whole country and seven times for Mississippi, the lowest ranking state.

INCREASE IN THE INCIDENCE OF BIRTHS IN HOSPITALS
THE UNITED STATES AND CERTAIN STATES

	1946	1945	1935
United States.....	82.4	78.8	36.9
Connecticut.....	98.9	98.4	74.5
Massachusetts.....	97.2	96.3	59.5
Mississippi.....	38.6	32.9	5.7

There are 139 hospitals in Massachusetts caring for newborn infants, who accounted for 61 per cent of all the days of hospital care for children. Bassinet occupancy was 54 per cent and the average newborn infant remained in the hospital 9.4 days. For the country as a whole the average period of hospitalization was 8.0 days. There were an average of 12.5 bassinets for every incubator.

During the report year Massachusetts hospitals reported a total of 79,903 births of which one out of every 25 was a premature infant weighing less than 2500 grams or five and one-half pounds. There were 3,252 premature infants cared for in 99 hospitals, but nearly two-thirds of these infants were cared for in 43 hospitals with separate premature nurseries.

Since 1937 Massachusetts has made a concerted effort to improve hospital conditions for prematures and to facilitate the transportation

DAYS OF CARE FOR NEWBORN INFANTS IN GENERAL HOSPITALS PER YEAR
UNITED STATES AND CERTAIN STATES

	Number of births in general hospitals	Days of care	
		Total	Per birth
United States.....	2,274,600	18,239,463	8.0
Highest state.....	6,097	62,501	10.3
Pennsylvania.....	154,558	1,453,846	9.4
Massachusetts.....	79,903	750,215	9.4
New York.....	251,932	2,246,138	8.9
Lowest state.....	47,290	231,075	4.9

of these infants to hospitals suitably equipped to care for them. Forty-eight premature centers are maintained throughout the Commonwealth and Boards of Health are legally empowered to pay for the transportation of infants to these centers. In addition Boards of Welfare are authorized to pay for hospitalization of premature infants.

As regards the quality of care available to newborn infants data were secured similar to those for general hospitals serving older children. The results are shown in the following table:

PER CENT OF BIRTHS OCCURRING IN HOSPITALS WITH
SPECIFIED CHARACTERISTICS

	United States	Massa- chusetts
Formulae sterilized.....	91.8	93.6
Any house staff.....	59.8	65.2
Graduate nurse on duty in the nursery at all times.....	89.4	88.6
Separate formula room.....	76.4	77.8
Separate nursery for sick or suspect infants.....	39.0	55.8
Average.....	71.6	76.1

Those interested in averting outbreaks of infectious diarrhea of the newborn will note that about 23 per cent of births occur in hospitals without a separate formula room and 45 per cent in hospitals lacking separate facilities for infants who are ill or suspected of infection.

In summarizing the hospital situation in Massachusetts, as it affects children, several points can be made. All but three of the 40 hospitals admitting children are in metropolitan or adjacent counties. Massachusetts ranks third among the states with respect to the rate of beds reserved for children. About 12.4 per cent of the total beds

in general hospitals are reserved for children. Three-fourths of child admissions occur in hospitals of over 100 beds, and 87 per cent of child admissions are to hospitals with pediatric units. More than half of the pediatric beds are situated within a 25 mile radius of Boston. Children's beds are relatively scarce in the three isolated counties of the state.

Pediatric beds are used to about 62 per cent of their capacity. However, occupancy is as low as 45 per cent in certain municipal hospitals.

Two-thirds of the hospitals are voluntary institutions. Most of the children's admissions occur in institutions reasonably well equipped for the purpose, but there is evidence of need for greater nursing supervision and separate facilities for sick infants.

The care of newborn infants in Massachusetts is almost entirely concentrated in hospitals, and 45 per cent of the births occur in hospitals without isolation facilities for sick infants.

Special Hospitals

Since the special hospitals in the Commonwealth which admit children are principally devoted to providing chronic or convalescent care they will be discussed in the following chapter. Certain acute hospitals are included here: the Massachusetts Eye and Ear Infirmary, which is the only institution of its kind in the state; and seven contagious disease hospitals.

The Massachusetts Eye and Ear Infirmary reported 198 beds, of which 40 were reserved for children. It had 6201 admissions during the report year, of which 1707 or 27.6 per cent were children. The average hospital stay per child was 2 days.

The seven contagious disease hospitals were all operated by governmental agencies and were located in Worcester, Springfield, Somerville, Lynn, Salem, Lowell and Greenfield. They do not represent the total contagious disease facilities in the state, since isolation units are maintained in a number of general hospitals including the Boston City and Massachusetts Memorial Hospitals. The relatively small number of contagious disease hospitals is undoubtedly due to the growing realization that such units are expensive to maintain and unnecessary when the community has suitable general hospital facilities. The seven institutions under consideration had 400 beds of which 110 were reserved for children. However over half their admissions were children (682 out of 1298). They provided a total of 38,235 days of care, 25,443 of which were rendered to patients under the age of 15.

Hospital Care of Rheumatic Fever Cases

It is not possible to state the extent to which children with acute rheumatic fever constitute a problem for general hospitals in Massachusetts. Only 52 hospitals reported on this item, of which 42 admitted 360 child patients with the disease who stayed in the hospital an average of 20.6 days per case (variation 6-44.6 days). The Boston Floating Hospital and the Children's Hospital together reported 8,144 admissions and 35 admissions with rheumatic fever. The admission rate is therefore approximately 4.3 per 1,000 for the two pediatric hospitals reporting.

The general hospitals of the state appear to be providing only acute care for children with rheumatic fever. Chronic care is provided either in the home or through the special facilities of such agencies as the House of the Good Samaritan, and the Children's Mission to Children. These will be considered in the next chapter.

The 52 hospitals which admitted rheumatic fever cases all had X-ray service, electrocardiography, and facilities for doing sedimentation rates. A cardiac consultant was available in only 42.

The Out-Patient services available for the care of cardiac cases are discussed in Chapter IX.

Hospital Care of Poliomyelitis Cases

One hundred and eighteen hospitals reported on their policies and practices with regard to cases of poliomyelitis. Slightly more than half (55.1 per cent) admitted cases for emergency care or diagnosis only. Only one-quarter (23.7 per cent) would admit for actual care as well. Only three of the hospitals were in isolated counties and only one of these would admit for care. Seven communicable disease hospitals were included in the list.

There were actually only 28 hospitals in the report year which admitted cases of poliomyelitis. The 256 cases admitted received an average of 20.9 days of hospital care each. It is evident that general hospitals are not providing chronic care for patients with poliomyelitis. Patients requiring long term rehabilitation are generally sent to the orthopedic centers in Boston or Springfield.

While on the one hand it would seem wise to concentrate the responsibility for cases of poliomyelitis in hospitals especially equipped to care for all possible complications, the admission policies of certain institutions seem unnecessarily restricted, especially in the isolated counties of the state.

Data have not been tabulated which would indicate how well equipped these hospitals are for their purpose. A recent survey has

just been completed by the Massachusetts office of the National Foundation for Infantile Paralysis and those data are more complete and contemporaneous.

The Out-Patient facilities available for the after-care of cases are discussed in Chapter IX.

CHAPTER VII

CONVALESCENT AND CHRONIC CARE

HISTORICAL NOTE

Special provision for the chronic and convalescent care of children in Massachusetts began to be made about the end of the nineteenth century. The hospital at Tewksbury, later to be known as the State Hospital and Infirmary, was founded in 1854. Contagious disease hospitals were built very early, but although they dealt with many children they did not at first practice segregation of child patients.

The New England Peabody Home for Crippled Children, established for the treatment of bone tuberculosis in childhood, was founded in 1895, and in 1904 the Massachusetts Hospital School at Canton began its work. These were among the first institutions to concentrate on the problem of chronic disease in childhood. In 1908 the state tuberculosis sanatoria at Lakeville and North Reading were opened and very early received child patients. Later the state sanatorium at Westfield was opened for children only. Another institution working with tuberculosis was the Pendergast Preventorium in Boston, founded in 1903.

Among the first institutions to provide convalescent facilities for children was the Wellesley Convalescent Home, founded in 1869 by the Ladies Aid Association of the Children's Hospital. In 1914 the Children's Mission to Children began placing children with medical problems in its foster homes.

In the field of rheumatic heart disease, the House of the Good Samaritan in Boston has had for many years a unique position as curative, teaching and research center. This institution was founded in 1861 by Anne Robbins, but did not begin to limit its work to Rheumatic Heart Disease until 1931.

Facilities for the chronic care of patients suffering from cerebral palsy and the after-effects of poliomyelitis have not been extensively developed. The legislature approved the admission to Lakeville of poliomyelitis cases in 1936 and of cases of cerebral palsy in 1941. However funds have not yet been made available for the development of a state program specifically directed at the problem of cerebral palsy.

There are 27 institutions providing chronic and convalescent care to children in Massachusetts. Ten of these are operated by governmental and 17 by voluntary agencies. They provide facilities for the care of patients with mental disorders and tuberculosis, for children convalescent from acute disease or for children with ortho-

pedic conditions requiring long term care. There are 10 institutions for the mentally deficient and epileptic. The following table gives the distribution of these hospitals, the beds available for each, and the total days of hospital care rendered for the report year for each type of hospital:

GENERAL AND SPECIAL HOSPITALS IN MASSACHUSETTS
PROVIDING CONVALESCENT AND CHRONIC CARE

Type of Hospital	Number of hospitals	Total number of beds	Children's beds	Days of care	
				Total	Children
Mental.....	2	2,117	100	41,975	32,654
Tuberculosis.....	4	708	400	145,447	85,834
Convalescent and chronic †.....	7	444	308	104,933	75,375
Orthopedic.....	4	458	458	109,395	109,395
Mentally deficient and epileptic.....	10	7,086	1,821	1,831,646	270,205
	27	10,813	3,087	2,233,396	573,463

†—6 out of 7 hospitals reporting.

Eighty-five per cent of all chronic and convalescent beds are devoted to the care of individuals who are mentally sick, mentally defective or epileptic. Nearly two-thirds (63 per cent) of children's beds are maintained for this purpose.

Children receive about one-quarter of the total days of care rendered by these institutions and have about 28 per cent of the total beds. Less than five per cent of all hospital beds are reserved for the general care of convalescent or chronically sick children. Twenty-six per cent of the beds available for the mentally deficient and epileptic are for children. Over half (56.3 per cent) of the beds in institutions admitting children for the care of tuberculosis are for child care. All of the available orthopedic beds are used for children.

The size of the waiting lists for admissions to these institutions can to a limited extent be considered a measure of the demand for the type of service rendered. However, under present conditions when there is a general shortage of nurses, particularly in public institutions where salaries are low, waiting lists may be artificially small. The study data do not show that there is a tremendous demand for special hospital facilities with one very notable exception: the 10 institutions for the care of the mentally deficient and epileptic. These reported a combined waiting list of 2,585 for the report year.

The number of admissions per bed per year varies greatly with the

type of hospital. Those for mental, tuberculous and orthopedic cases average less than one admission per bed per year. Convalescent and chronic hospitals care for five times as many admissions. If only children's beds are considered, there are half as many admissions to convalescent and chronic institutions and 12 times as many to those for the mentally deficient and epileptic.

There is a considerable difference in the amount of graduate nursing care available for chronically sick children compared with those needing only custodial care. There are as many as 130 beds per graduate nurse in the case of the mentally defective and epileptic, but for tuberculous, orthopedic, and convalescent and chronic cases there are from six to 22 beds per graduate nurse.

BED UTILIZATION AND NURSING COVERAGE IN
CHRONIC AND CONVALESCENT HOSPITALS

Type of hospital	Number of hospitals	Admissions per bed per year	Per cent of beds occupied		Number of beds per graduate nurse
			Total	Children's beds	
Mental.....	2	0.6	*	89	130.2
Tuberculosis.....	4	0.7	56.1	58.5	11.5
Convalescent and chronic.....	7	4.7	66.5	67	6.9
Orthopedic.....	4	0.9	65.2	65.2	21.7
Mentally deficient and epileptic †....	10	0.06	93.5	76.8	128.

*—Not calculable from available data.

†—Out of 10 hospitals reporting.

The per cent of bed occupancy reported for tuberculosis sanatoria, for orthopedic hospitals and for chronic and convalescent institutions is about the same as the rate for general hospitals throughout the state. It is above 75 per cent for institutions caring for those with neurological or psychiatric problems.

Mental Hospitals

The two hospitals admitting mental cases in children are the Boston Psychopathic hospital and the Metropolitan State Hospital. They have 100 children's beds. These two institutions admitted 225 children in the report year. These hospitals both admit cases having psychoses. One of them will take cases with mental deficiency, cerebral palsy or mongolism. Both institutions have qualified medical directors, and have social service departments. Only the Boston Psychopathic hospital has a medical house staff and an Out-Patient Department.

Tuberculosis Hospitals

Of the four tuberculosis hospitals admitting children, two are state operated, Lakeville State Sanatorium and North Reading State Sanatorium. The state sanatorium at Westfield stopped admitting children about 1937. Prendergast Preventorium is maintained by the Boston Tuberculosis Association for children from five to fifteen years who have been exposed to tuberculosis, and the Sassaquin Sanatorium admits children from the New Bedford area. The combined capacity of these institutions is 708 beds, of which 400 are for children. All of them have qualified medical directors, two have a medical house staff, and all of them provide teaching facilities for the instruction of children during their period of hospitalization. All but Sassaquin Sanatorium have social service departments.

Both Lakeville and North Reading are now being used for the care of patients other than those with tuberculosis. Since 1946 beds have been available for the treatment of children convalescent from poliomyelitis. The care of children with cerebral palsy at Lakeville has also been authorized, but facilities have not yet been developed. North Reading Sanatorium is being utilized for the care of patients with rheumatic heart disease. Thus far a weekly diagnostic clinic serving patients from the Northeastern Health District is in operation. This is staffed with personnel from the House of the Good Samaritan in Boston and that institution provides any necessary bed care. Neither of these institutions appears to care for patients in the age group 17 to 21 years where there is said to be a need for facilities.

Convalescent and Chronic Hospitals

The seven institutions providing convalescent and chronic care are as follows:

Sharon Sanatorium, Sharon.

Abbie Francis Lawton Memorial Home, Springfield.

Convalescent Home for Children, Wellesley.

Children's Mission to Children, Boston.

House of the Good Samaritan, Boston.

Robert Breck Brigham Hospital, Boston

Pondville Hospital, Walpole.

Sharon Sanatorium was active until 1946 when it merged with the Children's Medical center and sold its property to the Norwood Hospital. At the time of the Study it was providing bed care to convalescent children with rheumatic heart disease. The same function has for long been served by the House of the Good Samaritan

and the Children's Mission to Children. The latter cares for its patients in medically supervised foster homes.

The House of the Good Samaritan has worked for many years cooperatively with the Children's Hospital in providing long term care to rheumatic fever patients. It is also a research and teaching center. The Robert Breck Brigham Hospital serves a larger variety of patients, but is especially equipped for the treatment of rheumatoid arthritis, non-pulmonary tuberculosis, rheumatic heart disease and nephritis. Pondville is almost entirely devoted to the care of adults with cancer, but did admit 6 child patients the year of the Study.

Only four of these seven institutions reported having a qualified medical director. Only two had any medical house staff. Three of them reported having a social service department and the same number had provision for school instruction of patients. The House of the Good Samaritan and Pondville were the only hospitals having out-patient departments.

Orthopedic Hospitals

There are four orthopedic hospitals used for the care of children only. They are located as follows:

Massachusetts Hospital School, Canton.

New England Peabody Home for Crippled Children, Newton.

Sol-e-Mar Orthopedic Hospital for Children, South Dartmouth

Shriners' Hospital for Crippled Children, Springfield.

Together these institutions provide 458 orthopedic beds. All four provide school instruction, but only two have social service departments and out-patient service.

Hospitals for the Mentally Deficient and Epileptic

Six of the ten institutions in this category are privately owned. However, they provide less than a fifth of the beds available for children. The four state institutions included are the Wrentham State School, the Walter E. Fernald State School, Belchertown State School, and Monson State Hospital. The first three of these are for the care of the feeble-minded. Eight of these institutions will take children with mental deficiency, three will admit cases with convulsive disorders and four will admit patients with cerebral palsy. Monson provides for the care of children with epilepsy. The private institutions are devoted to the care of children who are principally mentally defective. Eight of these institutions provide for the instruction of patients. All the state institutions and the Hospital Cottages at Baldwinville have social service departments. (The latter institution was closed in 1948.) The study data were not so tabulated

as to disclose the situation at the State Infirmary in Tewksbury. Here the demand for beds for defective children has meant that the greater part of the children's service has had to be devoted to their care.

CHAPTER VIII

CLINICS AND DISPENSARIES

HISTORICAL NOTE

Dispensary service to children usually developed in hospitals, although there were clinics which arose independently in response to local needs. The Children's Hospital provided out-patient service as early as 1875. Later children's clinics were established at the Boston Dispensary and the Massachusetts General Hospital in 1903. The clinic at the Boston Dispensary was given departmental status in 1904. Pediatrics was not recognized as a separate specialty at the Massachusetts General Hospital until 1910.

Out-patient services account for only a small part of total medical service to Massachusetts children. About five per cent of all service is provided through clinics.

There are 45 out-patient departments admitting children in the state of Massachusetts, exclusive of well-child conferences, mental hygiene services, and services for the handicapped. Forty-two of these are in general hospitals and three are independent clinics in the city of Boston. There is only one hospital out-patient department in the isolated counties of the state. Thirty-four clinics are in hospitals of over 100 beds, 25 of which have separate clinics for children.

Out-patient facilities are relatively scarce in Health Districts 2, 5, 7, and 8. There are no pediatric clinics in Health District 2, and only one in districts 6 and 8. This, of course, does not mean that it is impossible for children to secure clinic care, but is rather a measure of a relative lack of special diagnostic facilities.

Massachusetts rates sixth among the states in terms of the amount of out-patient care provided for children by general hospitals. The number of visits to out-patient departments per 1,000 children per year for the whole country is 62.0. That for Massachusetts is 112.3 per 1,000, or almost twice as great.

During the report year 108,337 children visited hospital out-patient departments. Ninety-four per cent of these visits (101,806) were made to clinics in the greater metropolitan counties of the state, or those immediately adjacent to Boston. Only 245 visits were made in isolated counties. The total number of clinic visits per day was 297.

More than half of the out-patient departments had separate pediatric clinics. There were 25 of these, of which 23 reported that they provided special services. These special clinics were distributed as follows:

SPECIAL OUT-PATIENT SERVICES FOR CHILDREN

	Number of special clinics
Allergy.....	7
Cardiology.....	10
Mental hygiene.....	7
Luetic.....	5
Neurology.....	5
Surgery.....	10
Eye.....	8
Ear, nose and throat.....	10
Orthopedic.....	10
Dental.....	6

The only special clinic in the isolated counties of the state was an orthopedic clinic.

Special hospitals for children also have a number of out-patient departments which should be included as part of the total available clinic facilities. The following table shows the number of special hospitals and the number maintaining out-patient departments (exclusive of contagious disease hospitals and the one ear-, nose and throat hospital in the state):

Type of hospital	Number of hospitals	Number with out-patient departments
Mental.....	2	1
Tuberculosis.....	4	3
Convalescent and chronic.....	7	2
Orthopedic.....	4	2
Mentally deficient and epileptic.....	10	5

Out-patient services are infrequent in the less populated districts of the state and the rate of out-patient care is correspondingly low.

NUMBER OF CHILD VISITS PER DAY PER 1,000 CHILDREN

	Total out- patient visits	Total visits to clinics in general hospitals
Health District 1.....	.37	.04
Health District 2.....	.81	.00
Health District 3.....	1.24	.74
Health District 4.....	.18	.07
Health District 5.....	.22	.08
Health District 6.....	.76	.14
Health District 7.....	.45	.05
Health District 8.....	.17	.04

Children in the isolated counties of Massachusetts make less than half the clinic visits that children in metropolitan and adjacent counties do. Even more marked differences are seen if out-patient care is divided by health district:

The rate for total out-patient visits is lowest in districts 1, 4, 5 and 8, in fact it is very low in all the health districts except districts 3 and 6, where the larger hospitals in Boston and Worcester provide service.

Out-patient service is only a small portion of the total medical care received by Massachusetts children. Eighty per cent of the total clinic facilities are located in general hospitals of over 100 beds. Out-patient service is unevenly distributed throughout the health districts. Special pediatric clinics are only available in the urban areas of the state.

CHAPTER IX

DENTAL SERVICES

HISTORICAL NOTE

Organized dental services for children are of relatively recent origin in Massachusetts. The first dental clinic in the state was opened in Boston in 1867, for people of limited means. In 1915 the Forsyth Dental Infirmary was established in Boston for the treatment of dental conditions in children and the training of dental personnel. In the following year this institution inaugurated a school for dental hygienists.

Massachusetts was the first state to include dental hygiene in its public health program. A Supervisor of Mouth Hygiene was appointed in 1919 by the Massachusetts Department of Public Health. The first list of all the dental dispensaries in the state was compiled at that time. In 1920 a survey of dental caries was made which showed that 85 per cent of the children examined were affected and that only 10 per cent had ever had any dental care. In 1928 the dental certificate plan was launched and a program was gotten under way aimed at the dental examination of all schoolchildren. By 1931 there were 230 dental clinics at which 249 school dentists were employed. In 1934 the school clinics examined 65,291 children and completed treatment in 51,548. In 1932 traveling dental clinics began work in the rural communities of the state.

Because of the high incidence of dental decay in Massachusetts and the fact that reparative dentistry could not keep pace with the amount of existing caries, curiosity was aroused as to the possibility of reducing caries by the use of fluorine, and in 1945 studies on the efficacy of fluorine were begun. Increasing the number of dental hygienists in the state was considered another method of meeting the problem. In 1946 the Division of Dental Health was established in the Massachusetts Department of Public Health.

Massachusetts now provides more dental care for its children than any other state in the Union. Most of this is provided by dental practitioners and only about one-tenth of the total dental care received by Massachusetts children is furnished through clinics. Of 6,945 children seen on an average day 6,230 visited dentists' offices and 715 attended dental clinics for services other than examinations. All but six of the latter were children in metropolitan and adjacent counties. There are no dental clinics in the two isolated rural counties of Dukes and Nantucket.

Dental care in the state is divided as follows:

CHILDREN UNDER DENTAL CARE ON AN AVERAGE DAY

	Number	Number per day per 1,000 children
Children visiting dentists' offices	6,230	6.46
Children visiting dental clinics for services other than examinations.	715	.74
Total children receiving dental care.	6,945	7.20

There were 170 dental clinics in Massachusetts listed by the Study. There were 135 cities and towns with clinics under official and 29 with clinics under voluntary auspices. Clinics were considered to be official when they received all or a portion of their support from official sources. There are no state supported dental clinics. Clinics are either operated under local city or town autonomy or by private agencies.

Three-quarters of all dental clinic service to children is rendered by official agencies. During the report year children in the state received a total of 116,933 hours of dental service in clinics, of which 87,869 hours were furnished by official agencies.

Children attending dental clinics each make on the average two to three clinics visits per year. There were 121,156 children who made a total of 261,130 visits for service other than examinations. The amount of care received by pre-school and school children is not known for all clinics, inasmuch as clinic statistics do not always keep the two age groups distinct. However age groups were known for 100,453 patients and 200,840 visits. (This amounted to 83 per cent of the patients and 77 per cent of the visits.) Preschool children in this group made an average of 3.1 visits during the report year and schoolchildren 2 visits. About three children were examined for each patient given service.

There is considerable variation in the rates of dental service in different parts of the state. Children in Metropolitan Boston (Health District 3) receive much more service than do those in other districts. The table on page 69 shows the various rates of dental service in the health districts of the state.

Rates of dental service, expressed in terms of dentist hours, patients, visits or examinations are much higher in District 3 than in any other part of the state. Consistently low rates are observed in districts 1, 5 and 8. When rates for official and voluntary agencies are compared, it appears that children attending official clinics receive three times as many dental hours of care, make five times as many visits, and have three times as many dental examinations as do those cared

RATES OF DENTAL SERVICE BY HEALTH DISTRICT

NUMBER PER 1,000 CHILDREN

Health district	Dentist hours	Patients	Visits	Examinations
1	28.6	51.9	136.7	102.3
2	58.5	101.7	235.6	429.9
3	231.4	187.0	430.0	639.9
4	77.0	110.4	192.8	291.2
5	45.2	92.3	163.7	122.8
6	68.9	88.9	125.5	97.4
7	73.9	103.3	208.2	225.6
8	29.2	42.7	139.4	244.5
Whole State	121.2	125.6	270.6	377.2

for by voluntary agencies. However, children in official clinics make fewer visits per patient and they receive less than half the number of examinations provided to children by voluntary agencies. In other words official agencies care for more children, but provide less service to the individual child. This is further shown by an analysis of the type of dental service rendered (extractions, fillings, prophylaxes and orthodontic visits). Of a total of 82,988 patients, for which the type of service was reported, there were 233,233 services rendered, or 2.8 per patient. The rate for official agencies was 2.7 per patient and for voluntary agencies 4.0 per patient. These services were distributed as follows:

NUMBER OF DENTAL SERVICES REPORTED

Number of patients in Clinics reporting		Total	Extractions	Fillings	Prophylaxes	Orthodontic visits
All Agencies	82,988	233,233	47,641	115,429	68,646	1,517
Official	77,311	210,719	43,373	102,591	64,253	502
Voluntary	5,677	22,514	4,268	12,838	4,393	1,015

The ratio of fillings to extractions, i. e. the amount of reparative work done, is highest in the voluntary clinics. The ratio for official clinics is 2.37 and for voluntary clinics 3.01.

Although Massachusetts children receive the greatest amount of dental care in the country it is clear that this is not evenly distributed nor of uniform quality.

CHAPTER X

NURSING SERVICES

HISTORICAL NOTE

The need for nursing service to the poor was given early recognition in Massachusetts. Provision for needy families was a responsibility assumed by the conscientious citizens of every town, who after a time pooled their efforts by organizing local visiting nurse associations. These organizations provide invaluable service in nearly every community in the state.

The first visiting nurse association was founded at Boston in 1886 and was known as the Instructive District Nursing Association. In 1922 this joined with the Milk and Baby Hygiene Association to form the Community Health Association. In 1942 it became known as the Visiting Nurse Association of Boston.

As interest in the health of children increased and effective methods for controlling infectious diseases were developed, the Massachusetts Department of Public Health and local boards of health began to employ nurses to work on specific health programs, to care for the needs of school-children, and to work in the well-child conferences operated under their jurisdiction. Bedside nursing was the principal concern of the voluntary visiting nurse associations, but there was often pooling of effort and funds.

In 1920 the Boston Health League developed a Committee on Public Health Nursing concerned with the improvement of the nursing program in the city. In 1937 this became the Greater Boston Nursing Council. The Massachusetts State Health Commission reported in 1935 that there were then about 1,300 public health nurses in the state, 325 of which were working in the city of Boston. There was then one nurse for every 3,350 inhabitants in the state, or one for every 2,500 in Boston. However, nursing services were very unevenly divided throughout the Commonwealth.

A total of 350 communities in the Commonwealth reported on the public health nursing services available in their communities. Of these 101 cities and towns provided complete nursing service and an additional six towns provided complete service except for bedside nursing.

The 284 official and voluntary nursing agencies in the state reported that they employed a total of 938 nurses, of whom 883 or 94 per cent were full-time paid employees. Over half of these were employed by

voluntary agencies. On the average there were 91.5 full-time nurses per 100,000 children, but their distribution was uneven. Health District 6 was low with only 73.4 nurses per 100,000 children and Health District 5 high with 116.2 per 100,000. Metropolitan Boston (Health District 3) had 97.9 per 100,000 children.

During the report year public health nurses in Massachusetts made 530,155 home visits to children, or 549 per 1,000 children. Health District 4 had the lowest rate of service (251 per 1,000). Health districts having the lowest service rates were districts 2 and 6. The highest rate was that in Health District 8, 1057 per 1,000 children. Rates of nursing service were lowest in the greater metropolitan counties (446 per 1,000) and highest in isolated semirural counties (986 per 1,000).

The training of public health nurses has long been a matter for discussion by public health authorities. A total of 854 nurses (91 per cent of all nurses) reported on this item. There were 686, or 80 per cent, who had had no formal training or had completed less than one year in an approved program of public health nursing. Those health districts with the highest proportion of relatively untrained nurses were districts 1, 5 and 8, where 90 per cent or more did not come up to this standard.

**NURSES WITH PREPARATION IN AN APPROVED PROGRAM OF
PUBLIC HEALTH NURSING**

Whole state	Number reporting	Number who completed one academic year	Number with none or less than 1 year	Per cent
	854	168	686	
Health District				
1	71	7	64	90
2	94	28	66	70
3	301	82	219	73
4	104	12	92	88
5	110	11	99	90
6	59	12	47	80
7	94	16	78	83
8	21	0	21	100

Massachusetts ranks third among the states in public health nursing service. It has over twice as many full-time public health nurses per 100,000 children as the whole country (91.4 vs 40.4). Massachusetts children received 549.5 home nursing visits per 1,000

compared with a national rate of 209.8. Every health district in the state has a higher rate for nursing visits than the country as a whole.

Although there is considerable variation in the rates of service reported by the various health districts, there is no consistent correlation between the rate of nursing care and the rural character of the district. This is probably related to the fact that local initiative in the individual cities and towns has been the determining factor in the development of nursing services.

CHAPTER XI

SCHOOL HEALTH

HISTORICAL NOTE

Interest in the health of Massachusetts schoolchildren became evident at about the beginning of the twentieth century. In 1877 Henry P. Bowditch had made the first of several reports on the growth of school children in the state. Soon specific health measures began to be adopted. In 1900 children were excluded from school unless they had been vaccinated and in 1906 the employment of school physicians became obligatory. Beginning that year, annual physical examinations for all pupils were required. Fifteen years later the employment of school nurses was also made mandatory, and by 1924 every community in the state had school nursing service or was in the process of arranging for it. In 1925 Dr. Henry Chadwick launched a ten year program for the detection of juvenile tuberculosis. Extensive tuberculin testing of schoolchildren and the x-raying of reactors was done throughout the state. The Metropolitan Life Insurance carried out a school health study in Newton in 1929.

Gradually attention was directed to the detection of visual and auditory defects in schoolchildren, and to the provision of special educational facilities for those who were handicapped. In 1930 the Massachusetts General Court provided for the education of such children in their homes. In 1936 audiometers were first provided by the Department of Public Health for testing hearing in communities not otherwise able to provide this service. During the first year of the program 88 towns requested tests and 8,964 children were examined. In 1940, with the development of the Massachusetts vision test, routine annual testing was begun in a good many communities.

Some type of medical service is almost universally available to the school children of Massachusetts. Annual physical examination of all schoolchildren and school nursing service are required by law. While there were no counties in the state without medical service, there were seven towns which failed to report employing medical personnel. All but one of these were very small rural communities.

The study did not determine exactly the total number of elementary school children in the state. The population from five through 14 years, 589,760, may be taken as a rough estimate of the number of children concerned. There were at least 86,553 pupils in parochial schools, of whom 31,237 or 36 per cent were in municipal Boston. Parochial schools were reported in 48 cities and towns.

In Massachusetts, school health service may be provided either by the educational or health authorities, or both. It is customary for local school boards to employ the doctors and nurses who work in the public schools, and for boards of health to provide service to parochial schools.

Full details regarding the extent of service to elementary school children are not known. However there is certain information available concerning the type of personnel employed in the public schools.

There were 602 school doctors, of whom 536 or 88 per cent were general practitioners. They were divided into the following categories:

	Number	Per cent
General practitioners.....	536	89.0
Pediatricians.....	47	7.8
Other specialists.....	19	3.2
<hr/>	<hr/>	<hr/>
Total.....	602	100.0

The reports from the parochial schools in the state likewise showed that general practitioners were most frequently employed. There were only 47 pediatricians working in the public and only 7 in the parochial schools.

A total of 579 or 96 per cent of all school physicians worked in metropolitan or adjacent counties, which contain about 98 per cent of the population from 5-15 years of age. Only 23 were in the isolated counties of the state. The agencies employing these doctors were divided as follows:

EMPLOYMENT OF SCHOOL PHYSICIANS

	Number employed by	Per cent
Official health agencies.....	115	19.1
Official educational agencies.....	444	73.7
Joint official agencies.....	39	6.5
Other agencies.....	4	.7
<hr/>	<hr/>	<hr/>
Total.....	602	100.0

There were 552 school nurses, of whom 229 were full-time workers. Many of these were engaged in providing generalized nursing service in their communities and were usually employed half-time by the school board and half-time by the local Visiting Nurse Association or the Board of Health. As the following table shows, about 70 per cent worked for the school authorities:

EMPLOYMENT OF SCHOOL NURSES

	Number employed by	Per cent
Official health agencies.....	118	21.4
Official educational agencies.....	393	71.2
Official joint agencies.....	38	6.9
Other agencies.....	3	.5
 Total.....	 552	 100.0

There is no statewide provision for dental service in the schools. A few communities have clinics operated under the educational system and these usually restrict their activities to examining children and referring them to local dentists for treatment.

It has been recommended that health service in the schools include the follow-up of children found to have physical defects in the course of school health examinations. This and participation in health education are the responsibility of the school nurse. Questions on these phases of the school health program were asked, but tabulated data are not at present available.

CHAPTER XII

FACILITIES FOR HEALTH SUPERVISION

HISTORICAL NOTE

The health supervision of children was an outgrowth of the endeavor to make the artificial feeding of infants safe. In Massachusetts and elsewhere in the country, the struggle against diarrheal disease led to the founding of "feeding stations" where safe milk could be distributed to needy families. As the quality of milk improved, immunization against communicable disease and advice regarding other aspects of child rearing came to be a more important consideration.

In 1891 Thomas Morgan Rotch developed a laboratory for the modification of milk for babies and in 1909 the Milk and Baby Hygiene Association began to conduct well-baby clinics in Boston. These were eventually turned over to the city of Boston in 1924 when the present health units were created.

In 1915 the importance of child health was officially recognized when a separate Division of Hygiene was created in the Department of Public Health. In 1918 a weighing and measuring campaign was instituted through the state and the report of the Massachusetts Child Conservation Committee gave communities opportunity to review their facilities for child care. Soon the state began to set up well-child conferences on a demonstration basis, and in 1927 Dr. Susan M. Coffin, an indefatigable health worker, began a five year demonstration of well-child clinics in Franklin County. Conferences were developed independently in many communities. Very often the local Board of Health and Visiting Nurse Association joined forces in maintaining these services.

The importance of the practicing physician in supervising the health of children has already been discussed in Chapter V. The general practitioner accounts for 67 per cent, and the pediatrician for 25 per cent of all health supervision.

Massachusetts ranks second among the states in the amount of health supervision furnished to children under five years of age, and has 9.9 pre-school children under health supervision per day per 1,000 children. This is nearly twice the national average of 5.5 per 1,000. The following table and Fig. 11 show the comparative rates for the United States and for certain selected states.

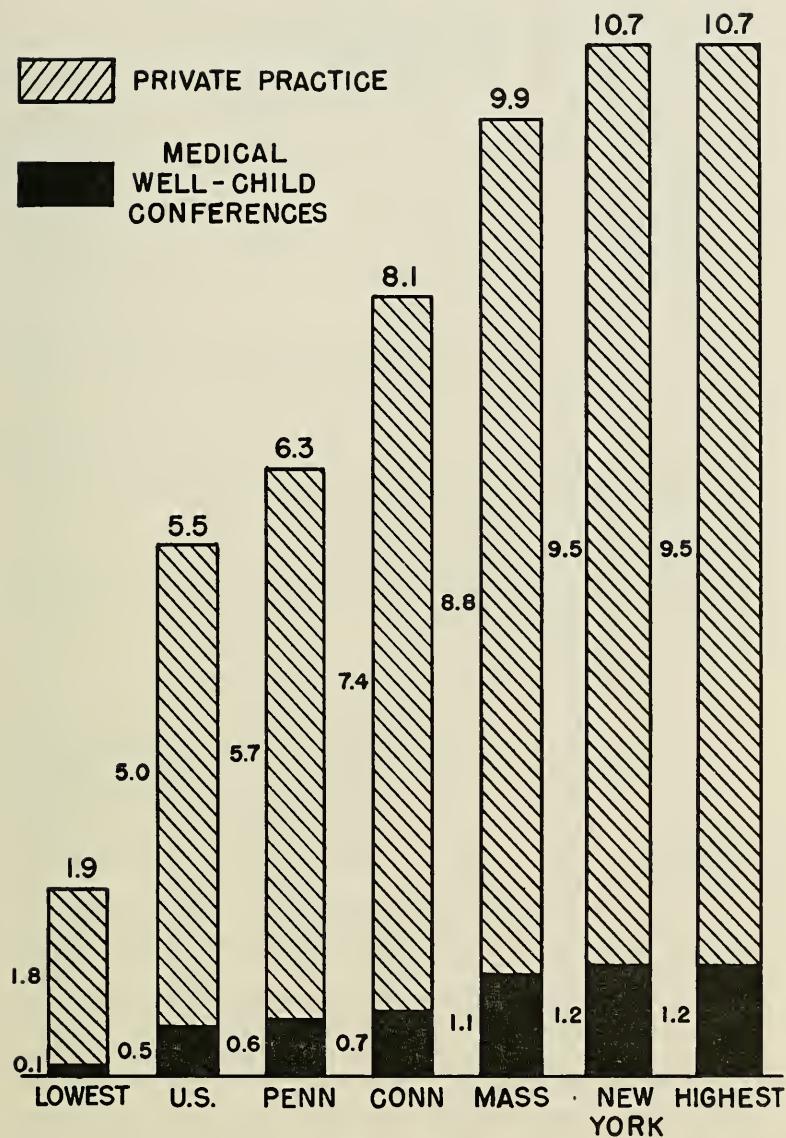


FIGURE 11. Children receiving health supervision on one day per 1,000 children in Massachusetts, the United States and selected states.

**PRE-SCHOOL CHILDREN UNDER HEALTH SUPERVISION PER DAY
PER 1,000 CHILDREN**

	Total	Private practice	Well-child conferences
United States.....	5.5	5.0	0.5
New York.....	10.7	9.5	1.2
Massachusetts.....	9.9	8.8	1.1
New Jersey.....	9.4	8.2	1.2
Connecticut.....	8.1	7.4	0.7
Pennsylvania.....	6.3	5.7	0.6

For northeastern states such as Massachusetts and New York slightly over ten per cent of health supervision is provided by well-child conferences.

The rate for visits to well-child conferences (visits per year per 1,000 children under 5 years) in the whole country is highest in greater metropolitan counties and progressively diminishes as more rural areas are considered. The rate for isolated rural counties is only one-tenth of that for greater metropolitan counties. This is not the case in Massachusetts, where an isolated semi-rural region like Barnstable County has a higher rate than the lesser metropolitan or adjacent counties.

**VISITS TO WELL-CHILD CONFERENCES PER YEAR PER
1,000 CHILDREN UNDER 5 YEARS**

	Greater whole state	Lesser metro- politan	Isolated semi- rural	Iso- lated rural
United States	181.5	421.6	220.7	65.0
Massachusetts	393.7	460.3	276.1	173.1
				325.0
				19.5

There are also variations in the amount of care rendered by well-child conferences in the various health districts, as the first table on page 79 will show.

There are many fewer children receiving health supervision in well-child conferences in health districts 4, 5 and 8 than in the rest of the state. This is true for all children other than newborn or for infants and pre-school children only.

During the report year there were 276 well child conferences in operation in the state of Massachusetts, 172 of which were under official and 104 under voluntary auspices. In all 7,283 sessions were held. There was an average of 19.4 sessions for each 1,000 children under 5 years of age. The second table on page 79 shows the number

TOTAL SERVICE IN WELL-CHILD CONFERENCE BY HEALTH DISTRICT

	Number of children other than newborn per day per 1,000 children	Infants and pre-school children per 1,000 children under 5
Whole state	.42	1.08
Health District 1.....	.33	.86
Health District 2.....	.81	2.10
Health District 3.....	.50	1.25
Health District 4.....	.11	.30
Health District 5.....	.14	.36
Health District 6.....	.62	1.64
Health District 7.....	.40	1.02
Health District 8.....	.14	.37

of sessions by age group and the number per 1,000 children under 5 for each health district.

SESSIONS OF WELL-CHILD CONFERENCES BY HEALTH DISTRICT

HEALTH DISTRICT	NUMBER OF SESSIONS				NUMBER OF SESSIONS PER 1,000 CHILDREN UNDER 5 YEARS
	Total	Infants only	Pre-school children only	Infants and pre-school children	
Whole state	7,283	839	318	6,126	19.4
Health District 1	682	281	0	401	18.4
Health District 2	1,151	294	11	846	28.7
Health District 3	3,030	102	202	2,726	21.4
Health District 4	540	48	0	492	10.9
Health District 5	446	10	0	436	13.5
Health District 6	316	0	0	316	11.8
Health District 7	936	104	104	728	25.8
Health District 8	182	0	1	181	16.8

Well-child services are least available in health districts 4, 5 and 6 and most frequent in the region around Metropolitan Boston (districts 2 and 3) and in the Connecticut River Valley (District 7).

A total of 51,816 patients made 147,640 visits to these conferences, or an average of 2.8 visits per patient per year. The number of visits was lowest in health districts 4, 5, 7 and 8. Separate figures for infants were not always obtainable and the number of visits per patient for infants and pre-school children were not calculated separately unless the age group was reported for at least 90 per cent of the total number of patients. Infants made more visits per year than did pre-school children and in one instance the ratio was as high as 5.3 to 1. Conferences in many communities are held regularly and at

frequent intervals, but in certain towns they may be held as infrequently as twice a year.

The service rendered by well-child conferences varies throughout the health districts of the state. Most clinics provide nursing service and advice on feeding, care and training. Consultant services are considerably less frequent:

PER CENT OF WELL-CHILD CONFERENCES SESSIONS PROVIDING

	Public health nursing follow-up in the home	Advice to mothers	Consultant service by	
			Nutritionist	Psychologist or Psychiatrist
Whole state	99.7	81.8	61.5	19.9
Health District 1	98.4	99.7	57.2	47.2
Health District 2	100.0	33.9	95.1	7.4
Health District 3	100.0	84.6	66.1	11.6
Health District 4	97.7	84.9	20.9	5.6
Health District 5	100.0	98.0	9.4	8.5
Health District 6	100.0	98.7	62.0	30.4
Health District 7	99.8	100.0	65.9	55.7
Health District 8	100.0	98.9	7.2	2.2

Public health nursing service is almost universally available in the health districts of the state. Advice to mothers by the physicians attending the clinics is somewhat less frequent and this is especially notable in Health District 2, where only about one-third of the sessions provide medical advice. Sixty-two per cent of the sessions had nutrition service. This should not be interpreted as meaning that a nutritionist was on hand at every session, but rather that the services of the state nutritionist were procurable when needed. Only about one-fifth of the sessions had a psychologist or psychiatrist available for consultation.

Immunizations are not carried out in many well-child conferences in the state. This may be because immunization has been considered the prerogative of the general practitioner or the duty of the board of health. The first table on page 80 shows the number and the per cent of sessions providing immunization service in the various health districts.

Except in health districts 3 and 7 only a small percentage of sessions provide immunization service. The relatively high frequency for all three types of immunization in District 3 is due to the large number of children inoculated by the well-child conferences of the Boston Health Department. Even in the clinics where the number of children immunized is known, the percentage of children inoculated is relatively

WELL-CHILD CONFERENCES PROVIDING IMMUNIZATION SERVICE

	Number of sessions reporting	Smallpox & diphtheria		Whooping cough	
		Number	Per cent	Number	Per cent
Whole state	6,527	2,141	32.8	2,121	32.5
Health District 1	602	30	5.0	30	5.0
Health District 2	1,151	0	—	0	—
Health District 3	2,603	1,878	72.1	1,744	67.0
Health District 4	529	0	—	0	—
Health District 5	403	0	—	0	—
Health District 6	241	21	8.7	100	41.5
Health District 7	822	208	25.3	247	30.0
Health District 8	176	4	2.3	0	—

small. With the exception of tetanus inoculations, the percentage of immunizations by official agencies is greater than that by voluntary agencies.

PER CENT OF CHILDREN IMMUNIZED AGAINST SPECIFIC DISEASES BY OFFICIAL AND VOLUNTARY AGENCIES

Agency	Smallpox	Diphtheria	Whooping cough	Tetanus
All	47.1	29.2	28.4	21.0
Official	81.1	33.7	37.7	6.3
Voluntary	12.6	19.3	16.2	21.3

Slightly less than half of the children in well-child conferences offering service are immunized against smallpox, and slightly more than a quarter against diphtheria and whooping cough.

There is considerable variation in the frequency of immunization reported in various health districts.

PER CENT OF CHILDREN IMMUNIZED IN WELL-CHILD CONFERENCES TO SPECIFIC DISEASES, BY HEALTH DISTRICT

Health District	Smallpox	Diphtheria	Whooping cough	Tetanus
Whole state	47.1	29.2	28.4	21.0
District 1	7.6	15.3	16.9	1.7
District 2	5.9	40.8	—	—
District 3	72.5	28.5	39.0	22.8
District 4	—	—	—	—
District 5	—	—	—	—
District 6	29.8	33.1	1.7	—
District 7	10.1	16.2	16.3	—
District 8	38.6	64.2	—	—

Immunization was not reported by the clinics maintained in districts 4 and 5. Whooping cough inoculations were reported in only

five of the eight health districts, and tetanus immunization in three. A scrutiny of immunization figures for clinics in the Greater Boston area has also shown that there is great variation in the practices followed by individual clinics. In many of these communities diphtheria immunization is provided by the board of health and smallpox vaccination by the well-child conference. There may be considerable variation between individual clinics as to the age at which immunization is offered. In certain Greater Boston communities diphtheria immunization is postponed until after the first year.

The following table shows the number of immunizations reported by community agencies in the state in one year and the number reported by well-child conferences alone:

**IMMUNIZATIONS REPORTED IN ONE YEAR BY WELL-CHILD
CONFERENCES AND ALL COMMUNITY AGENCIES¹**

	Well-child conferences	All community agencies	Number per 1,000 children
Smallpox ²	5,229	10,649	11.0
Diphtheria.....	3,128	39,849	41.3
Whooping cough.....	2,716	3,040	3.2

¹ Number of immunizations reported by agencies in 13 out of 14 counties.

² No adults included.

General practitioners and pediatricians participate about equally in conducting well-child conferences in Massachusetts. Health officials constitute about one-fifth of the total number. Pediatricians are more frequent participants in health districts 2 and 3.

MEDICAL PERSONNEL WORKING IN WELL-CHILD CONFERENCES

	Number of sessions	Per cent
Health officials.....	1,571	19.6
Pediatricians.....	3,402	42.5
General practitioners.....	3,043	37.9
 Total.....	 8,016	 100.0

Pediatricians and general practitioners usually work in well-child conferences on a part-time paid basis. Pediatricians receive on the average \$7.04 per session and general practitioners \$6.63. There are marked variations in the remuneration paid by various clinics (from \$1.50 to \$25.00 per session). Pediatricians received no pay at 104 sessions and general practitioners at 358 sessions. The average session lasted two hours.

CHAPTER XIII

SERVICES FOR THE PHYSICALLY HANDICAPPED

HISTORICAL NOTE

Massachusetts has a long history of special service to its physically handicapped children. Many various types of programs for the handicapped originated in the Commonwealth.

Some of the earliest work was that done with the blind. The Perkins Institute was established in 1832. The General Court in 1906 provided for the annual testing of the vision of schoolchildren and in 1913 the first sight-saving class for myopics was established in Roxbury. By 1934 the registry of the blind included 471 minors and there were 500 enrolled in 39 sight-saving classes.

Work with the deaf began about the same time. The first lip-reading school was established at Boston in 1902. By 1923 there were 585 individuals in schools for the deaf maintained at the expense of the Commonwealth, and 1212 children learning lip-reading. By 1935 there were estimated to be over 35,000 children in 73 communities with a hearing loss of 9 or more decibels.

Organized work with the crippled child may be said to have started in 1894 when the Industrial School for Crippled Children was founded. In 1916 the Harvard Infantile Paralysis Commission began its service under the leadership of Dr. Robert Lovett. This organization developed clinics about the state where children could receive physical therapy and medical supervision close to their homes. Recognition was given to the educational problems of the crippled child in 1930, when school committees were legally permitted to employ a special teacher if they had responsibility for five or more crippled children. Three years later special home teachers were at work in 41 communities.

In 1931 a special survey, carried out by the Department of Public Welfare, located 6,141 crippled children in the state. The present program has been aided since 1936 by grants in aid under the Social Security Act.

Services for the physically handicapped in Massachusetts have been promoted over a considerable number of years and present services represent the expansion of a well developed voluntary system of care for the crippled child by which orthopedists from Boston, principally those at the Massachusetts General Hospital and The Children's Hospital, provided consultation service throughout the New England area extending as far as Burlington, Vermont, to the West. Voluntary

activity was particularly manifest in the field of infantile paralysis.

When the Children's Bureau developed services for crippled children under the Social Security Act, it was possible to provide service to children with all types of physical handicaps.

At the present time there are 11 clinics maintained in Massachusetts under the Crippled Children's Program. These provide diagnostic service and any needed social service or public health nursing. Clinics are held every 2-3 months and serve children and young adults from birth to 21 years of age. The services originally cared for physically crippled children only, but their scope has now increased so as to provide speech training and supervision of children in need of plastic surgery. The staff present at sessions usually consists of an orthopedic surgeon, a social worker and a public health nurse. There is no provision for medical, i. e. pediatric, supervision. The main function of the clinic is to oversee long periods of treatment and to select cases for operative correction at the medical centers in Boston. At present there is no provision through these clinics for the care of children with chronic heart disease, or those with defects of vision or hearing.

The Harvard Infantile Paralysis Commission maintains 10 Clinics immediately around and to the north of Boston. These principally provide physiotherapy for infantile paralysis patients. The clinics in Lowell, Lawrence and Haverhill are visited twice a year by orthopedists from the Children's Hospital or Massachusetts General Hospital and referred to Boston for special orthopedic care. Children in clinics nearer to Boston, such as those in Waltham, Malden, Arlington and Dedham visit the Children's Hospital in Boston for regular orthopedic supervision. These physiotherapy clinics are held approximately once a week and usually there is no doctor in attendance at each session.

There are a few other agencies working with crippled children in the state. The Visiting Nurse Association in Springfield maintains an orthopedic treatment center, which furnishes public health nursing service. It has no doctor in attendance. In Boston, the Industrial School for Crippled and Deformed Children cares for children from 6 to 21 years of age and serves children with orthopedic difficulties and defects of speech, vision and hearing. A clinic is operated in connection with the school and furnishes diagnostic service, hospitalization, treatment facilities and social service. It does not furnish appliances or braces.

A unique service to children with heart disease is furnished through the Committee for the Home Care of Children with Heart Disease, with headquarters at the Massachusetts General. This carries to bed-

ridden children in their homes social service and occupational therapy and has long complemented the cardiac program of the heart clinic at the Massachusetts General Hospital.

The Boston Health Department maintains a special eye clinic for children from five to 14 years of age, which provides diagnostic service for those suspected of having significant visual defects. It does not furnish glasses as a part of its program. There is one ophthalmologist on its staff.

The six agencies already discussed served a total of 2,450 patients during the report year. These children made 3,533 visits and attended a total of 325 sessions. Children attending the treatment clinics of the Harvard Infantile Paralysis Commission made as many as 10 visits each.

It is impossible to compare the services for crippled children in Massachusetts with those received by children in other states, because the facilities listed omit the very important contribution of out-patient clinics and hospitals in the medical centers of Boston.

This report does not cover the valuable services of agencies such as the Bay State Society for Crippled and Handicapped and the National Foundation for Infantile Paralysis which furnish appliances and pay for the hospitalization of cases. The Bay State Society has also developed, since the time of the survey, services for children affected by cerebral palsy in Worcester, Springfield, Fall River and Boston. The Study schedules did not do justice to the very important work of the Massachusetts Eye and Ear Infirmary with children handicapped by defects of vision and hearing.

In addition to the agencies already mentioned a considerable amount of service to handicapped children is rendered by hospitals and clinics in the state. There are 42 general hospitals and three independent clinics concerned. Twenty-three of these maintain special facilities, including 10 cardiac clinics, 8 eye clinics, 10 ear nose and throat clinics and 10 orthopedic clinics. These services are centralized in the neighborhood of Boston, Springfield and Pittsfield. Districts 2, 4, 5 and 6 are without any such special services and any future program should consider the development of such facilities in these areas.

CHAPTER XIV

SERVICES FOR THE MENTALLY HANDICAPPED

HISTORICAL NOTE

Provision for the needs of the mentally sick was made an official duty of government in Massachusetts as early as 1834, when hospitals for the insane were first established. Recognition of the fact that children needed segregation from their elders in such institutions was slow to develop. The early decades of the twentieth century were the time when psychiatric advances provided a surge of optimism and interest in the problems of the maladjusted child. In 1913 the Massachusetts Society for Mental Hygiene was founded.

It was logical that official action should begin with the school system. In 1914 Walter E. Fernald sent out from the state school at Waverley the first of a series of travelling clinics, whose function was the examination of those children whose poor progress in school was attributed to mental retardation. By 1919 the General Court provided for the obligatory examination of all children who were three or more years retarded in school and for special classes where more than 10 retarded children were found in a community. The examining was done by personnel from the state mental hospitals. In the first 10 years of this program 5,043 cases were registered. By January 1944 the total was 12,000 cases.

As the work of these clinics became recognized the need for treatment became increasingly evident and the clinics became partly therapeutic in their function. It was soon realized that successful work required the combined efforts of a team composed of a psychiatrist, a psychologist and a social worker.

Gradually efforts were made to have the communities where clinics were established take some responsibility for their support. In 1921 Dr. Douglas A. Thom established three habit clinics under the auspices of the Community Health Association of Boston. The clinic at the Boston Dispensary became a part of its Children's Department in 1925. The training of medical and other personnel began to be a function of these centers for child guidance. By 1928 there were 15 such clinics, and by 1934 clinics were held in 221 cities and towns. Three-quarters of the children examined were seen for mental retardation. In 1943 the Southard Clinic was established at the Boston Psychopathic Hospital, which may be considered another step in the recognition that children need to be treated in facilities different from those provided for adults. In 1946 the National Mental Health Act was passed. This provided

funds which, while insufficient to meet the many needs in the state, were instrumental in sustaining and expanding the work of various voluntary and official agencies particularly with reference to community service and the training of personnel.

Massachusetts has a well developed system of institutions providing custodial care for children who are mentally handicapped. There are four state hospitals admitting children with various types of mental defect and two state schools for the feeble-minded. Children with epilepsy are cared for principally at the state hospital at Monson. There are also facilities in Belchertown, Lancaster and in the state infirmary at Tewksbury. The state schools at Waltham and Wrentham have long maintained services for mentally deficient children. These have not limited their service to custodial care, but the personnel of these institutions have provided clinics for the psychological evaluation, diagnosis and to a limited extent the treatment of children who were retarded.

In addition there are six private institutions for the mentally deficient. These are: Smith School, Milton; Pollock School, Brookline; Freer School, Arlington Heights; Nila Sanatorium, Woburn; Perkin's School, Lancaster; Hospital Cottages for Children, Baldwinville (closed in 1948).

All these institutions are principally concerned with furnishing custodial care to mentally handicapped children. The long-waiting list at the state institutions, which has been a source of concern for many years, is unmistakable evidence of the inadequacy of existing facilities. The waiting list now amounts to about 4,000.

Mental hygiene clinics are available in every county and health district. Present data do not permit an estimate of the adequacy of service according to population or special needs. The five state mental hospitals at Danvers, Gardner, Northampton, Springfield and Taunton together maintain 14 mental hygiene clinics. In addition the Division of Mental Hygiene of the State Department of Mental Health and the City of Boston each maintain seven clinics. There are, therefore, 21 official clinics furnishing mental hygiene service in the state. In addition there are three voluntary agencies, two of which are located in Boston; and seven hospitals in the state which have special mental hygiene facilities. Four of these are in District 4, one in District 6 and two in District 7.

During the report year 5,159 patients made 20,373 visits to mental hygiene clinics in Massachusetts, or an average of 3.9 visits per patient. Sixty-four per cent of the visits were made to official agencies. Children attending voluntary clinics made 4.3 visits each.

The average attendance per clinic day was 14.5. Children served by voluntary agencies would therefore seem to be receiving slightly more service than those attending official clinics.

All the clinics in the state reported that they had complete staff service, which would mean at least a part-time psychiatrist, psychologist, and social worker. Sixty-two per cent of the clinics had a full-time psychiatrist in attendance.

Children in the isolated counties of the state receive a disproportionately small amount of service. Only 80 visits out of 20,293 or .4 per cent of the total were made by children in these rural areas.

Study data do not definitely measure the need for mental hygiene service in the state. It is, however, commonly realized by doctors, pediatricians and social workers that the facilities available are far less than the actual or potential demand. In Boston it is difficult to secure clinic service and there would appear to be no question but that further clinics are needed. The relatively small number of voluntary clinics providing service and the very apparent need to experiment with new types of service make it apparent that voluntary efforts should be stimulated in other parts of the state rather than in the Boston area.

CHAPTER XV

SUMMARY

The Massachusetts Study of Child Health Services is part of a nation-wide survey conducted by the American Academy of Pediatrics in 1945 and 1946. The Academy Study was undertaken in order to ascertain the extent and distribution of existing services for children throughout the country. The report of its findings, "Child Health Services and Pediatric Education," was published in April 1949. The Academy report did not make recommendations for future action.

The members of the Academy conducting the study in each state were held responsible for making specific recommendations regarding their own health services. This, it was felt, would assure proper evaluation of local conditions in deciding what might be done.

The Massachusetts Study provides information which can be utilized in directing the development of future health services for the children of the Commonwealth. Its findings are summarized here before discussing their significance and the specific steps which might be taken to improve the *status quo*.

The child population in Massachusetts is smaller than in most of the other states. Less than a quarter of the inhabitants are children under the age of fifteen. In terms of what might be called youthfulness Massachusetts ranks forty-first among the states.

There are many fewer children in Massachusetts living in rural areas than in the rest of the country. More than a third of the children in the United States live in isolated counties, whereas in Massachusetts only 1.1 per cent are so situated. The proportion of children in Boston is higher than in the rural parts of the state.

Although it does not have a large rural population and its standard of living is high, Massachusetts has an unexpectedly poor health record for its mothers and children, in so far as these are measured by crude mortality rates. In 1946 among the states it ranked twenty-second in maternal mortality and twentieth in infant mortality. Boston, its principal city, had in the same year an infant mortality rate of 34.8 per 1,000 live births, or one point higher than the national average.

The total medical service provided for Massachusetts children is the third highest in the country. About 30 per cent of the children under medical care on an average day are receiving health supervision.

The national report of the Academy Study showed that the general practitioner was the most important agent providing medical care to

children. Visits by the family doctors accounted for about three-quarters of all medical care in Massachusetts, as well as in the United States. In addition they provided two-thirds of all health supervision.

Children in the three isolated counties of Massachusetts receive two-thirds of the pediatric care, one-third of the specialist care, one-fifth of the clinic care and about half as much hospital service as their fellows in metropolitan and adjacent counties. When medical care is compared by health districts, further inequalities are noted. Figure 12 shows the ranking of each of the health districts with respect to

FIG. 12.—COMPARISON OF HEALTH DISTRICTS BY VARIOUS MEASURES OF SERVICE
—ALL EXPRESSED AS RATES PER 1,000 CHILDREN

Health district	Number of physicians	Rank	Children visited by M.D.'s—Number per day		Children receiving health supervision	Rank	Number of sessions of Well-child conferences		Children in hospitals	Rank	Total child hospital admissions		Children under dental care	Rank	Number of times with low rank
			1	2			3	4			5	6			
1	3.8	7	12.2	8	3.3	8	18.4	4	3.0	6	61.1	7	4.3	7	6
2	3.9	6	15.0	6	5.3	1	28.7	1	2.7	8	56.4	8	6.8	2	4
3	6.4	1	15.8	3	5.1	2	21.4	3	4.1	1	84.4	1	7.9	1	0
4	4.3	4	16.3	1	4.6	3	10.9	8	2.8	7	61.5	5	5.5	5	2
5	4.2	5	13.3	7	3.3	7	13.5	6	3.3	5	61.3	6	6.3	4	4
6	3.6	8	15.3	4	3.8	6	11.8	7	3.5	4	71.3	3	4.9	6	4
7	4.8	2	15.0	5	4.6	4	25.8	2	4.0	2	75.5	2	6.4	3	0
8	4.7	3	15.9	2	4.4	5	16.8	5	3.6	3	64.4	4	4.3	8	1

rates for certain kinds of medical service. The three lowest ranking districts have been indicated in bold type. Districts 1, 2, 5 and 6 have the lowest rankings.

Massachusetts children enjoy the highest rate of dental care of any state. Nine-tenths of dental care is furnished by dental practitioners. The rate of clinic care is three times that for the whole country but service is not evenly distributed.

The state ranks high with respect to hospital facilities for children. It is fifth in number of total beds, third in the number of children's

beds, and ninth in number of child admissions per 1,000 children. There are 17,545 beds in the whole state or 18.2 per 1,000 children. However in the three isolated counties general hospital beds total 11.6 per 1,000. There are 0.5 pediatric beds per 1,000 children. More than half of these are situated within a 25 mile radius of Boston, and all but three of the 151 hospitals admitting children are in metropolitan or adjacent counties.

The larger general hospitals provide most of the hospital care for children. Those of 100 or more beds account for nearly three-quarters of all child admissions. Pediatric beds are occupied to about 62 per cent of capacity.

It was possible to some extent to measure the quality of hospital care by listing certain hospital characteristics. These related to the availability of nursing and medical staff, laboratory facilities and safeguards against infection. Hospitals with separate pediatric units were more apt to possess these characteristics. However a considerable proportion of children were admitted to hospitals not possessing the characteristics in question. Thirty per cent of all child admissions occurred in hospitals where there was no graduate nurse in charge of the pediatric unit. In 36 per cent infants other than newborn were not protected from cross infection by segregation from older children in a separate nursery.

Nearly all (97.2 per cent) children in Massachusetts are born in hospitals. In isolated counties the rate is 89.7 per cent. There are more non-white mothers not delivered in hospitals. Newborn infants account for 65 per cent of all the days of hospital care provided for children.

Certain conditions prevailing in newborn nurseries predispose to neonatal infection. Seventy-three per cent of the births in Massachusetts hospitals occur in institutions without a separate formula room, and 45 per cent occur in hospitals lacking separate facilities for infants who are ill or suspected of being sick.

Nearly 85 per cent of all convalescent and chronic hospital beds are devoted to the care of the mentally sick, the mentally defective and the epileptic. About two-thirds of the beds reserved for children are maintained for this purpose. Waiting lists in hospitals caring for such children are very long, and the amount of supervision by graduate nurses is far less than in other institutions caring for the chronically sick. There is need, especially in mental hospitals, to separate children from adults.

Clinics and dispensaries account for about five per cent of all medical service. The rate of clinic care in the state is nearly twice that for the whole country. Eighty per cent of all the clinics caring

for children are in hospitals of over 100 beds, and more than half of these have separate pediatric clinics. There is only one hospital outpatient department in the isolated counties of the state. Facilities are relatively scarce in districts 2, 5, 7 and 8. Special pediatric clinics are almost all located in the more urban areas.

The rate of dental care by clinics is high in Massachusetts. Three-quarters of all dental clinic service is provided by official agencies. There is considerable variation in the rates of service for individual health districts. Children in the neighborhood of Metropolitan Boston (District 3) receive much more care than do those in other districts, whether this is expressed in terms of dentist hours, patients, visits, or examinations. Official dental agencies care for more children, but provide less service to the individual child.

Fifty-nine per cent of the 351 cities and towns in the Commonwealth reported that they maintained some type of public health nursing service. The distribution of public health nurses is uneven and the rates for service to children are likewise variable. There may be several nursing agencies in a single city or town without provision for coordination of effort. Only a small percentage of nurses have had much formal nursing training. Of 854 nurses 686, or 80 per cent, had had no formal training in a recognized program of public health nursing or had completed less than one academic year.

Some kind of medical service is almost universally available to the schoolchildren in Massachusetts. While there are no counties without school health supervision, seven towns failed to report any service. Eighty-eight per cent of the physicians in the public schools are general practitioners. Only 47 of 602 school physicians were pediatricians. Less than half of the 552 school nurses are employed full-time.

Massachusetts ranks second among the states with regard to the amount of health supervision for pre-school children. It has nearly twice the national average. One-tenth of this care is provided by well-child conferences. Although the rate of care tends to be lower in rural areas, Barnstable County has a higher rate than the lesser metropolitan and adjacent counties in the state. Health districts 4 and 5 have the lowest rates of care. Over half of the 276 well-child conferences reporting were maintained by official agencies. An average of 2.8 visits per year per child were made. In a few towns conferences were held only twice a year. Infants receive more care than older children. Practically all conferences provide nursing service and medical advice is available at 82 per cent of all sessions. Approximately two-thirds provide nutrition service and one-fifth psychological or psychiatric advice. Only a small percentage of

sessions provide immunization. One-third immunize against diphtheria, whooping cough and smallpox. In those clinics where the number of children immunized is known, it is found that slightly less than one-half of the children are vaccinated and about one-quarter are immunized against diphtheria and whooping cough. The practices employed in various clinics are far from uniform. General practitioners and pediatricians together provide about four-fifths of the medical service, and most of them are part-time paid employees. Five per cent of general practitioners and 1.3 per cent of the pediatricians serve without compensation.

Facilities for the care of physically handicapped children are fairly evenly distributed throughout the state. However the available clinics limit their service to children with orthopedic complaints and speech defects. Only one clinic outside of a hospital was listed which was concerned with the diagnosis of children having defects of vision or hearing. This is an ophthalmological clinic operated by the Boston Health Department.

The existing services for mentally handicapped children are limited. Twenty-one of the 31 clinics are staffed by personnel from state mental hospitals and 64 per cent of the visits were made to clinics maintained by official agencies.

CHAPTER XVI

DISCUSSION

The Massachusetts Study is the second survey of health services for children in the state and can truly be called a report of progress. Since the work of the Massachusetts Child Conservation Committee in 1918, there have been significant changes in the trends both for population and for mortality rates. There are 850,000 more inhabitants, but the birth rate has decreased from 24.5 in 1918 to 21.3 in 1946 (in the 10 preceding years the rate went as low as 14 per 1,000). In the same period the maternal mortality diminished from 9.2 to 1.3 per 1,000 live births, and the infant mortality from 112.7 to 30.9. The population is increasing more slowly, but loss of life has been reduced.

A brief comparison of the schedules used in the two surveys shows that in nearly every city and town the number of health agencies and their personnel have increased and with them the total of services rendered. There are now a large number of official and voluntary health agencies in the Commonwealth, often functioning without any formal relationship to each other or to the over-all health problems in the state.

The high standard of medical care now provided for Massachusetts children has already been demonstrated. The following table shows the national ranking of the state with respect to measures of service:

	National ranking
Per capita income (1940-1946).....	12
Children under medical care per day per 1,000 children.....	3
Children under dental care per day per 1,000 children.....	1
Children and persons per physician.....	2
Children per pediatrician.....	5
Child visits by doctors per day per 1,000 children.....	3
Beds in general hospitals per 1,000 children.....	5
Beds for children in general hospitals per 1,000 children.....	3
Per cent live births in hospitals.....	4
Patients in well-child conferences and visits per year per 1,000 children under 5.....	3
Visits to mental hygiene clinics per year per 1,000 children.....	6

Considering these evidences of good health, one may ask whether there is much need to improve conditions as they already exist.

However mortality rates in other parts of the country are lower, and in addition there are inequalities in the distribution of facilities and services which will have to be eliminated before it can be said that all Massachusetts children have an equal chance to survive and grow to maturity.

It is disconcerting to find that Massachusetts in 1946 ranked twenty-second among the states with respect to maternal mortality and twentieth with respect to infant mortality. Although it is agreed that such rates are not the only measure of the efficacy of a health program, still one does not expect such a highly developed state as Massachusetts to be outstripped by rural states like Nebraska and North Dakota, or by such nearly comparable neighbors as Rhode Island and Connecticut. There is needless loss of life.

As is true of the whole United States, medical care for children in Massachusetts is not evenly distributed and is most deficient in rural areas. The general practitioner is the most important agent providing health service, but he lacks pediatric training adequate for meeting his responsibilities. This is true both of medical education at the undergraduate level and of the hospital training provided for many general practitioners.

In the realm of post-graduate education in pediatrics, a review of programs sponsored by the Massachusetts Medical Society or by the annual New England Post-graduate Fortnight, discloses relatively few papers dealing with the problems of children.

Since 1946 the Massachusetts Medical Society has developed a considerable program of post-graduate medical education. In co-operation with the Massachusetts Department of Health, it has given annually a two-months course of lectures twice a week, open to all members of the profession in Massachusetts and surrounding states. In 1946, 1400 different doctors were enrolled and fourteen sessions were held, including one each in obstetrics, pediatrics, and infectious diseases. The subjects under consideration included prenatal care, diet in pregnancy, growth and development, and prophylactic inoculations. The following attendance figures are illustrative of the relative "drawing-power" of various subjects:

	Number of doctors attending sessions
Obstetrics.....	350
Infectious diseases.....	400
Pediatrics (epidemic diarrhea of the newborn).....	350
Cardiovascular diseases.....	850

In addition to this centralized program of post-graduate education,

the Massachusetts Medical Society has furnished paid medical speakers to the ten district medical societies to give medical talks and clinics in the districts three or four times a year.

There is still another opportunity for improving the education of physicians in pediatric subjects. It was noted in Chapter VI that nearly a fifth of the physicians in the state lacked hospital privileges in near-by institutions to which their child patients were admitted. With means developed for including these practitioners in the educational activities maintained by hospitals and with the elimination of sub-standard medical schools, eventually more physicians should be able to enjoy hospital privileges.

What has been said of physicians is equally true of dental practitioners. The small number of dentists who specialize in children's work or in orthodontia is evidence of the relative lack of interest in the dental problems of early life. Children may require special handling, but they are at least the adult patients of tomorrow. The impossibility of doing adequate restorative work on children, even if means were found to pay for it, makes it advisable to extend the use of auxiliary dental personnel but especially to develop, if at all possible, effective means for mass prophylaxis against dental caries.

Hospital facilities for children in comparison with other states are adequate. There are 2.2 beds per 1,000 children under 15 years of age, but their distribution is uneven. In District 3, Metropolitan Boston, the rate is 3.3 per 1,000. However District 2 has only 1.2 beds per 1,000. The same is true of bassinets for new born infants. The rate for the whole state is 48.2 per 1,000 births, but in District 2 it is 33.6. It is not only a lack of beds, but the manner in which they are utilized and safeguarded, that is important. Although data are available showing the equipment and facilities available for the care of children, these are in many respects a poor measure of the kind of care which children may be receiving. About a third of the hospitals admitting children have no graduate nurse in charge of their pediatric beds and no facilities for the segregation of infants other than newborn. These and other shortcomings are matters which should be considered and, where necessary, be improved through the local action of practitioners interested in the welfare of children.

The efficiency with which hospital facilities for children are utilized is of interest. The occupancy rate for all the pediatric beds in the state is 62 per cent. This is well below optimum, which might be put at 70-80 per cent. In some municipal institutions the per cent of occupied beds is as low as 40-45 per cent. Construction of new hospital beds in a community should probably not be undertaken

until it is clear that facilities cannot be increased by better utilization of existing beds.

Hospital facilities for newborn infants do not adequately provide for the segregation of sick children when actually or potentially infectious. This situation is gradually being corrected through the initiative of the hospital division of the Massachusetts Department of Public Health. The Committee on The Fetus and Newborn of the American Academy of Pediatrics has already drawn up hospital standards based, not on law alone, but on the experience of pediatricians from all over the country. The importance of prematurity as a cause of neonatal death requires that interest in newborn nurseries be centered on the maintenance of suitable facilities for the care of such infants, or provision for their transport to suitable centers for care. Well trained personnel are more important than facilities in caring for these infants.

Judged by the length of their waiting lists, hospitals for chronically sick or convalescent children are relatively adequate with one exception, institutions for feeble-minded or epileptic children. It should be realized that waiting lists may not reflect the potential demand, because doctors, social workers and other referring agencies are apt to recognize that facilities are limited and attempts at admission useless. In addition the general shortage of nursing personnel has produced an artificial reduction in facilities. The demand for beds for chronic orthopedic cases is less than it used to be, largely because of a considerable reduction in the incidence of bone tuberculosis and chronic osteomyelitis. It is likely that this trend will continue. The prime need in the field of convalescent and chronic care is to provide more beds for the mentally deficient and epileptic.

It is clear that out-patient facilities are fewer in the isolated areas of the state. On the other hand the country practitioner runs his own out-patient department along with his practice. A relative lack of out-patient services may be only important with respect to the diagnostic facilities usually available in hospital clinics which the average practitioner cannot provide in his own office. Modern transportation reduces the necessity for providing a variety of out-patient services but the poor, who are in greatest need of corrective services, are least able to travel. Programs for the correction of physical defects will continue to be relatively ineffective and unnecessarily expensive as long as diagnostic and corrective services are inconveniently distant from the affected child. In Health District 1, for example, there are seven orthopedic surgeons, none of whom are closer to the three isolated counties of the state than Middleboro or

Fall River. There are 25 eye-ear-nose and throat specialists in the same area, only two of whom are located in the isolated counties. There is only one pediatrician in the same area. There is no orthopedic surgeon in Health District 6. There are relatively few eye-ear-nose and throat specialists in District 8. These facts do not by themselves call for the creation of out-patient facilities. Rather they should initiate inquiries as to whether children in these districts, who have actual or potential handicaps, are actually being served, or whether they remain undiagnosed and untreated.

A few general points may be made with regard to community health services for children. Well-child conferences cannot be considered really effective until they provide the medically indigent with continuously accessible facilities for examination, immunization, and medical advice. Dental care will continue to necessitate individual treatment until some form of mass prophylaxis is discovered and put into effect. The school child deserves better treatment by school health services. School health services are inadequate to meet the full needs of the school child. There are inequalities in public health nursing services due to a lack of uniformity in the qualifications of the nurses and their uneven distribution. The services furnished by the various supporting agencies are often not well correlated.

The many small community-supported clinics and services in the state lack integration, guidance and supervision. There are 276 well-child conferences, 170 dental clinics and 284 public health nursing agencies operated under independent auspices. The kind and quality of the services they provide need regular adjudication to suit local needs.

Well-child conferences may be held regularly in some communities at intervals sufficiently frequent to permit regular health supervision. However, there are a considerable number which are held as infrequently as twice a year. An average of 2.8 visits per year is clearly not enough to constitute regular health supervision. Not all clinics furnish medical advice. Consultant service in nutrition and psychology could advantageously be increased in many communities. The remuneration of attending doctors is often inadequate for the kind and duration of service rendered. It will be difficult to develop interest or improve standards until their compensation is improved.

The average well-child conference is not at present effective in immunizing children against the important contagious diseases. Not all conferences provide such service and those that do succeed in immunizing only a portion of their patients. While these conferences need not be the only agencies providing immunization, they could be

more effective with the clientele they serve. It is confusing to have the variety of procedures now existing. Boards of health customarily provide one type of service and well-child conferences another. This is discouraging for parents who often lack initiative in getting their children protected. The practices now existing in many cities and towns are not unified nor is present service consolidated. For optimal medical control well-child conference should be more often located in or near the local hospital. A similar condition exists relative to visiting nurse services. At present the diversity of health agencies, their physical separation, and the resultant partition of medical service discourage the medically indigent from securing health service. There is sufficient evaluation of the work done by well-child conferences, dental clinics, and public health nursing agencies. Each clinic tends to set its own procedures. This tends to make work in the clinic intellectually unstimulating. If towns wish to maintain their own services, there should be some provision for unification and supervision of their work. One or more adequately paid full-time pediatric consultants could do much toward improving the present situation. The solution of many child health problems would be facilitated if agencies were more often working in conjunction with local health units of adequate size, employing well trained full-time personnel.

Facilities for health education are only partly developed at the present time. Aside from the schools, the ante-partum clinic, the doctor's office, and the well-child conference are the most frequent points of contact with the public and the places where the principles of hygiene can be effectively taught. If more of these activities were centralized in the local hospital, better sponsorship would be assured and the public would more often feel that its sources of information were truly authentic. The present interest on the part of the Massachusetts Medical Society in the general field of health education has great possibilities.

CHAPTER XVII

RECOMMENDATIONS

Since the beginning of the Massachusetts Study in 1946 several other reports have been published concerned, at least in part, with the health of children in greater Boston and in the Commonwealth. In accordance with the policies formulated by the Committee for the Study of Child Health Services and for the purpose of reinforcing mutual efforts, study data have been made available to the agencies concerned. The recommendations made here have their counterparts in these other documents.

1. In Massachusetts as well as in the whole United States three-quarters of health service to children is provided by general practitioners. In consideration of the large proportion of practice which is concerned with children, medical schools should devote more attention to maternal and child health in their curricula, placing emphasis on the preventive techniques applicable in private practice. Where necessary, subsidies should be provided for augmenting these phases of medical education.

2. In addition to their present educational activities, the Massachusetts Medical Society and the two pediatric societies active in the Commonwealth, the Massachusetts Chapter of the American Academy of Pediatrics and the New England Pediatric Society, should sponsor actively programs for pediatric education at the post-graduate level. This should not only mean the inclusion of pediatric subjects in medical meetings, but also cooperation between these societies and the Massachusetts Department of Public Health in the development of training programs for all professional workers in the field of maternal and child health. Adequate funds should be made available for the maintenance of such programs.

3. Dental schools should likewise stress in their curricula preventive dentistry and the application of its techniques in childhood. Research should include an energetic inquiry into methods for dental prophylaxis which give hope of successful mass application. Where dental personnel is inadequate to maintain diagnostic and reparative services, greater use of auxiliary personnel should be considered.

4. Means should be developed for encouraging young physicians to settle in those parts of the Commonwealth where children are now receiving less than the average amount of health service.

5. Wherever possible hospital privileges should be extended to physicians who show an active interest in increasing their professional

competence by willingness to avail themselves of opportunities for postgraduate education.

6. The present cooperative efforts of the Massachusetts Medical Society and the Massachusetts Department of Public Health to reduce maternal mortality should be intensified. Some investigation of infant deaths should also be undertaken. The present system for reporting infant births and deaths needs improving.

7. Local hospitals should increase their existing safeguards against cross-infection in children's wards and newborn nurseries. Adequate isolation facilities are of major importance. Hospital conditions for newborn infants and for children will be more rapidly improved if the number of supervisory personnel is increased in the Division of Hospitals of the Massachusetts Department of Public Health.

8. Construction of new hospital facilities for children should be undertaken only after due study of local needs and the present utilization of existing beds. The limitations of the community hospital in treating children's diseases and furnishing health supervision deserves reconsideration. Although hospital care for the young is less in the isolated counties of the state, it should not be inferred that the erection of more children's beds will solve their needs.

9. More hospitals should admit cases of poliomyelitis for initial diagnosis and treatment, but special facilities for after-care should be so centralized as to permit of maximum efficiency and expert care.

10. There is an urgent need to increase present facilities for the hospital care of children with mental deficiency and convulsive disorders.

11. The Massachusetts Department of Public Health should be enabled to provide pediatric, nursing and other consultants for existing community health services so that health programs will be extended, and the activities of individual agencies improved and correlated.

12. Well-child conferences should increase the frequency of their health supervision and intensify their efforts to detect and follow up children with defects. The efficacy of the present immunization program should be improved and present immunization policies should be scrutinized. Opportunities should be increased for the training of doctors conducting well-child conferences. The development of health centers in or near community hospitals should be encouraged.

13. Dental clinics in the Commonwealth should be increased in areas of need.

14. Public health nursing services should be more adequately supervised and their services correlated. Under present conditions

service is unevenly distributed and there is too much opportunity for duplication of service. Efforts should be made to improve the standards for employment and training of public health nursing personnel.

15. The medical and dental professions should give support to the recommendations made in the "Report of the Special Commission to Study and Investigate Certain Public Health Matters" (House Document 2100—1949). Those having special interest are:

- a. The development of local full-time health services.
- b. Improvement in present methods for collecting vital statistics.
- c. The provision of adequate employment standards and salaries for public health personnel.

APPENDICES

APPENDIX A

HOW THE MASSACHUSETTS STUDY WAS CONDUCTED

1. *Organization*

As State Chairman of the Academy of Pediatrics in Massachusetts, Dr. James Marvin Baty was officially in charge of the study. Because of his commitments as a practitioner and teacher, he gave full administrative responsibility to the Executive Secretary, Dr. Lendon Snedeker. Work was begun on March 1, 1946, at which time the Executive Secretary visited the Central Office of the Academy Study to acquaint himself with plans and methods. By April first an office had been opened at 319 Longwood Avenue, Boston.

Miss Gloria Cantor was the first secretary for the Study, having been released from the Publicity Department of the Greater Boston Community Council by Mr. Roy Cushman, its Director. She was succeeded by Mrs. Howard Jamison and Miss Adele Weisberger. During the period when the principal business of the office staff was the mailing of letters and schedules throughout the state, it was necessary to secure additional secretarial help.

2. *Cooperating Agencies*

Approval of the Study by various professional and official groups was not difficult to obtain. The steps taken to secure this were as follows:

a. *Massachusetts Medical Society*.—The State Chairman of the Academy of Pediatrics, Dr. James Marvin Baty, is a member of the Council of the Society. On February 6, 1946, he appeared before this body and secured its approval for the conduct of the Study in Massachusetts. At the annual meeting, an exhibit booth was maintained to explain to the members the aims and scope of the survey. Subsequently the Study was referred to the Committee on Public Relations and Dr. Gerald Hoeffel was appointed its official representative.

b. *The Massachusetts Dental Society* was likewise approached and the project considered by their Council on Dental Health. The past President, Dr. Stephen Mallett, and his assistant, Mr. Maloney, both saw the importance of requesting approval from the American Dental Association and proceeded to secure this. The Executive Secretary was given an opportunity to speak before a general meeting of the society and to maintain an exhibit at the annual meeting in May of 1946.

c. *The Massachusetts Department of Public Health* provided invaluable assistance. This was true not only of the Commissioner, Dr. Vlado Getting, but of the Director of Maternal and Child Health, Dr. Florence McKay, and all the District Health Officers. The Department wished to have the study information available in every District Health Office and expected the cooperation of its health officers and personnel in securing the data. Furthermore it furnished office supplies and equipment, part of rent and telephone expenses, and provided the funds for the publication of this report.

d. *The Greater Boston Community Council*.—Early in 1945 the Council began to be concerned about the operating costs of various agencies for sick children in the Greater Boston area. A *Committee on the Study of Facilities for the Care of Sick Children* was appointed with Dr. Robert Morris, a Boston orthopedist, as chairman. Among its other members were Miss Ida Cannon; Mr. Roy Cushman, Director of the Council; Miss Marion Hall, head of the Social Service Department of the Children's Hospital; Dr. T. Duckett Jones; and Mr. Frank E. Wing of the Massachusetts Hospital Association. This committee expanded its original field of interest to study and report on health services for children in the Greater Boston area to the Joint Committee of the Greater Boston Community Fund and Council. After consultation with Dr. Warren R. Sisson, the chairman of the committee of the Academy Study, it postponed action until the Massachusetts Study should begin. Tentative plans were laid at a meeting in March, 1946. The Council released one of its staff to work with the Study. It helped further by making available the services of its Publicity Director and contributed to the financial support of the survey. The Study in turn made its statistical material available to the committee and was able to secure certain data on the Greater Boston area which was utilized in writing the report. Subsequently the Executive Secretary worked with their report committee and wrote part of the report himself.

3. Committees

The State Chairman appointed three committees to work on the Study. These were an *Executive Committee* of eleven members, composed of eight members of the Academy of Pediatrics and representatives of other important medical and dental groups; an *Advisory Committee* composed of representatives from organizations interested in the health and welfare of children; and a *Report Committee* of nine members which would be responsible for the publication of the State Report.

a. The *Executive Committee* of the Massachusetts Study originally had the following membership:

James M. Baty, M.D., Chairman
Lendon Snedecker, M.D., Vice Chairman
Richard M. Smith, M.D.
Herman C. Petterson, M.D.
George Kahn, M.D.
Vlado A. Getting, M.D.
Harold H. Hookway, D.M.D.
Donald A. Martin, M.D.
George King, M.D. (deceased)
Leroy Stokes, M.D.
William B. Adams, M.D.

The Executive Committee was responsible for approving the policies set by the State Chairman and for making suggestive criticism concerning the conduct of the Study.

b. The members of the *Advisory Committee* were:

Florence L. McKay, M.D., Division of Maternal and Child Health, State Department of Public Health.
Elizabeth E. Barry, Massachusetts Organization for Public Health Nursing.
Mrs. Besse Spaulding, Massachusetts State Federation of Women's Clubs.
Frank Wing, Massachusetts Hospital Association.
Nathaniel K. Wood, M.D., Massachusetts Tuberculosis League.
Helen G. F. Hutton, Bay State Society for the Crippled and Handicapped.
Thomas P. Athridge, Child Welfare Committee, American Legion.
Virginia Insley, American Association of Medical Social Workers.
Arthur C. K. Hallock, Massachusetts Child Council.
Bernice M. Henderson,* Massachusetts Society for Mental Hygiene.
Mrs. Irving W. Yelland, Massachusetts Parent-Teachers Association.
Esther P. Hill, State Department of Public Welfare.
George H. Nee, Jr., National Foundation for Infantile Paralysis.
Ethel Cohen, Associated Jewish Philanthropies.
Rev. Donald McGowan, Catholic Charitable Bureau.
Clifton T. Perkins, M.D., State Department of Mental Health.
Thomas W. Bowe, Massachusetts Federation of Labor.

*Deceased.

George Markham, Congress of Industrial Organizations.
Ida M. Cannon, Greater Boston Community Council.

The Advisory Committee met infrequently. Its members gave us publicity in their news bulletins and occasionally advised on various aspects of the Report.

c. The Report Committee

The Report Committee was composed of nine members including the State Chairman and the Executive Secretary. Six were fellows of the Academy of Pediatrics. Its members were as follows:

Dr. James Marvin Baty, Chairman
Dr. Lendon Snedeker, Vice-Chairman.
Miss Ida M. Cannon.
Dr. Joseph Garland.
Dr. Gerald Hoeffel.
Dr. Charles A. Janeway.
Dr. William H. Griffin.
Dr. Richard M. Smith.
Prof. Edwin B. Wilson.

The Report Committee met at intervals to consider sections of the report as they were written by the Executive Secretary.

4. Publicity.

Through personal contacts with leaders in the health and welfare field in Boston arrangements were made to publicize the Study in their news letters and bulletins. The Executive Secretary sought opportunities to speak before such groups as the Massachusetts Public Health Association and district medical societies. At the annual meetings of both the Massachusetts Dental and Massachusetts Medical Societies in 1946 it was possible to arrange for exhibit booths manned by dentists or pediatricians. Several editorials were published in the New England Journal of Medicine.

By early June in 1946 it was evident that something needed to be done about public relations through the press and radio. Mrs. Rose Weston Bull, Publicity Director for the Greater Boston Community Fund, agreed to act as Publicity Consultant and through her several opportunities were secured for radio talks. Newspaper releases were arranged in Boston and in local papers throughout the state. All these efforts were directed to securing publicity at the time when schedules were being distributed.

In 1948 the Executive Secretary reported on the progress of the Study before the Massachusetts Public Health Association, and the New England Pediatric Society. He was several times interviewed

by representatives from Boston newspapers with regard to the tentative findings of the Study.

5. Distribution of Schedules

The state was divided into 18 areas corresponding to those of the District Medical Societies. To each of these was assigned a District Pediatrician. This distributed responsibility and facilitated contacts between pediatricians, hospitals and practicing physicians.

Series I Schedules—Hospitals

Hospital schedules were distributed by district pediatricians to other pediatricians in their areas.

In Metropolitan Boston, because of the relatively large number of pediatricians and institutions, Series I schedules were assigned directly by the state office.

Certain state hospitals were reached through appropriate departments at the State House. In 1947 and 1948 Mr. Joseph Chamberlain secured certain missing data from Boston hospitals and the Executive Secretary carried on similar follow-up work with other hospitals about the state.

Series II Schedules—Clinic and Other Health Services

Series II schedules were distributed to and completed by the eight district health offices in the summer of 1946. During July of that year the Executive Secretary visited each of the District Health Offices at least twice and talked personally with the Public Health Nursing Supervisor or the Public Health Educator directly responsible for the work. Much confusion was thus avoided. It soon became apparent that the data we were seeking was usually available in each district office. Work was facilitated by arranging for the completion in Boston of schedules in the case of all state conducted clinics and state institutions. Circular letters were sent out to each District Health Office and to the Division of Local Health Administration in the State House informing them of the specific clinics and hospitals so covered. These measures, plus the presence of two Public Health Nurses sent into the field by the State Supervisor, Miss Brooks, gave the districts a feeling that someone was interested in lightening their work. Cooperation was excellent.

Series III Schedules—Physicians, Pediatricians and Dentists

Several methods were used in the distribution of these schedules. Schedules were distributed to pediatricians through the State office at the end of May, 1946. Practicing physicians received in June 1946 a letter from their District Pediatrician explaining the purposes of the

Study and requesting their cooperation. This was followed within about a week by the appropriate schedule and a letter from the Executive Secretary.

Dental Schedules presented no unusual problems. All members of the Massachusetts Dental Society received a letter from the President of the Society, Dr. Harold Hookway, describing the Study and asking their cooperation. This was followed in about ten days by a letter from the Executive Secretary enclosing the III-C schedule.

As many as three follow-up letters were required to secure the return of certain questionnaires.

The Massachusetts Report

After the schedules had been returned to the state office and checked they were forwarded to the central office for coding and tabulation. It was not until July 1, 1948 that complete tabular data were in our hands. In the *interim* the Executive Secretary had been able to use certain material for the Committee for the Study of Facilities for the Care of Sick Children.

Through the intervention of Prof. Edwin B. Wilson of the Report Committee it was arranged to have the report published by the American Academy of Arts and Sciences. The interest and courtesy of the Academy are herewith acknowledged with thanks.

By-Products of the Study

One of the cardinal principles stated by the Committee for the Study of Child Health Services was that study data should be made available to any responsible agency within the state on request. The collaboration between the Study and the Greater Boston Community Council has already been described. The Massachusetts Study found itself in the unusual position of being able to put data to work before the state report could be completed. In the summer of 1948 the Executive Secretary acted as consultant on the staff of the Greater Boston Community Survey under Dr. Ira V. Hiscock and collaborated with Dr. Leona Baumgartner of the New York City Health Department in writing that section of the survey report dealing with maternal and child health. This has already been published.

In addition, study data have been used in the preparation of two doctoral theses at Harvard University, and in teaching students at the Harvard School of Public Health and the Child Health Division of the Children's Medical Center.

APPENDIX B
STATISTICAL TABLES

TABLE 1. CHILD POPULATION, ESTIMATED AS OF JULY 1, 1945, BY HEALTH DISTRICT IN MASSACHUSETTS

Number of towns	Health district	Under 15 years	All Children under 5 years	Births 1944 by place of residence
351	Whole State	964,801	375,041	78,209
52	Health district 1	96,707	37,133	7,627
49	Health district 2	104,369	40,037	8,719
24	Health district 3	351,250	141,331	29,581
45	Health district 4	133,079	49,558	10,517
45	Health district 5	86,093	33,014	6,605
41	Health district 6	70,825	26,871	5,461
55	Health district 7	93,560	36,262	7,700
40	Health district 8	28,918	10,835	1,999

TABLE 2. CHILDREN UNDER MEDICAL CARE ON AN AVERAGE DAY, BY HEALTH DISTRICT IN MASSACHUSETTS

Health district	Children visited by physicians (office and home)				Children visiting clinics				Children in hospitals				Total children under medical care ¹	
	Total		By general practitioners		Outpatient departments		In general hospitals		In special hospitals		Total children in hospitals			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
NUMBER ²														
1 Whole State	14,538	11,426	1,642	1,470	803*	297	36	404	56	10	4,286*	3,376	910	19,627*
2 Health district 1 . . .	1177	1004	106	67	36	4	X	32	X	X	291	X	X	1504
3 Health district 2 . . .	1566	1395	72	99	84	0	X	84	X	X	278	X	X	1928
4 Health district 3 . . .	5549	4065	809	675	437	261	X	176	X	X	1,430	X	X	7416
5 Health district 4 . . .	2163	1726	212	225	24	9	X	15	X	X	370	X	X	2557
6 Health district 5 . . .	1142	901	135	106	19	7	X	12	X	X	281	X	X	1442
7 Health district 6 . . .	1083	950	25	108	54	10	X	44	X	X	245	X	X	1382
8 Health district 7 . . .	1398	995	245	158	42	5	X	37	X	X	378	X	X	1818
9 Health district 8 . . .	460	390	38	32	5	1	X	4	X	X	103	X	X	568
NUMBER PER DAY PER 100,000 CHILDREN														
10 Whole State	1506.9	1184.3	170.2	152.4	83.2*	30.8	3.7	41.9	5.8	1.0	444.2*349.9	94.3		2034.3*
11 Health district 1 . . .	1217.1	1038.2	109.6	69.3	37.2	4.1	X	33.1	X	X	300.9	300.9	X	1555.2
12 Health district 2 . . .	1500.5	1336.6	69.0	94.9	80.5	—	X	80.5	X	X	266.4	266.4	X	1847.4
13 Health district 3 . . .	1579.8	1157.3	230.3	192.2	124.4	74.3	X	50.1	X	X	407.1	407.1	X	2111.3
14 Health district 4 . . .	1625.4	1297.0	159.3	169.1	18.1	6.8	X	11.3	X	X	278.0	278.0	X	1921.5
15 Health district 5 . . .	1326.4	1046.5	156.8	123.1	22.0	8.1	X	13.9	X	X	326.4	326.4	X	1674.8
16 Health district 6 . . .	1529.1	1341.3	35.3	152.5	76.2	14.1	X	62.1	X	X	345.9	345.9	X	1951.2
17 Health district 7 . . .	1494.3	1063.5	261.9	168.9	44.8	5.3	X	39.5	X	X	404.0	404.0	X	1943.1
18 Health district 8 . . .	1590.7	1348.6	131.4	110.7	17.3	3.5	X	13.8	X	X	356.2	356.2	X	1964.2

¹ Cols. (2) and (4) based on 1-day records; col. (3), on 28-day records; cols. (5)–(13), on annual figures.

² If total visits by children not reported, assumed to be equal to visits to pediatric clinics. If neither figure reported, total visits by children estimated as 10% of total OPD visits.

³ Days of care estimated as children's admissions times seven, plus days of care to newborn.

⁴ Exclusive of institutions for mentally deficient and epileptic cases.

X Data not given by health dist., because of state-wide service.

* Sum of cols. (1), (5), and (11).

⁵ Includes items not classified by health dist.

TABLE 3. CHILDREN OTHER THAN NEWBORN RECEIVING MEDICAL SERVICE FOR HEALTH SUPERVISION¹ ON AN AVERAGE DAY, BY
HEALTH DISTRICT IN MASSACHUSETTS

Health district	HEALTH SUPERVISION						Percent of medical care for health supervision ⁴ (8)	
	Children visited by physicians (office and home)			Children receiving health supervision		Children visiting well-child conferences (5)		
	Total (1)	By general practitioners (2)	By pediatricians (3)	By other specialists (4)	(6)	(7)		
1 Whole State	4,377	3,278	1,013	86	404	4,781	16,043*	
2 Health district 1	321	266	55	0	32	353	1,186	
3 Health district 2	558	506	50	2	84	642	1,518	
4 Health district 3	1,777	1,212	515	50	176	1,953	6,007	
5 Health district 4	609	491	108	10	15	624	2,159	
6 Health district 5	286	198	88	0	12	298	1,169	
7 Health district 6	269	253	16	0	44	313	1,103	
8 Health district 7	431	255	152	24	37	468	1,432	
9 Health district 8	126	97	29	0	4	130	457	
							28.4	
							29.8*	
10 Whole State	453.7	339.8	105.0	8.9	41.9	495.6	1662.8*	
11 Health district 1	332.0	275.1	56.9	—	33.1	365.1	1226.4	
12 Health district 2	534.6	484.8	47.9	1.9	80.5	615.1	1454.5	
13 Health district 3	505.9	345.1	146.6	14.2	50.1	556.0	1710.2	
14 Health district 4	457.7	369.0	81.2	7.5	11.3	469.0	1622.3	
15 Health district 5	332.2	230.0	102.2	—	13.9	346.1	1357.8	
16 Health district 6	379.8	357.2	22.6	—	62.1	441.9	1557.4	
17 Health district 7	460.8	272.6	162.5	25.7	39.5	500.3	1530.6	
18 Health district 8	435.7	335.4	100.3	—	13.8	449.5	1580.3	

¹ Exclusive of health services in schools.

² Columns (2) and (4) based on 1-day records of physicians; column (3), on 28-day records; column (5), on annual figures.

³ Sum of columns (1) and (5).

⁴ Column (6) divided by column (7).

* Includes items not classified by health district (as on Table 2).

TABLE 4. CHILDREN UNDER DENTAL CARE ON AN AVERAGE DAY, BY HEALTH DISTRICT IN MASSACHUSETTS

Health district	Children visiting dentists' offices			Other specialists (4)	Children visiting dental clinics ² (5)	Total children receiving dental care ³ (6)
	Total (1)	General practitioners (2)	Pedodontists and orthodontists (3)			
NUMBER ¹						
1 Whole State.....	6,230	5,829	343	58	715	6,945
2 Health district 1.....	412	405	0	7	36	448
3 Health district 2.....	708	703	5	0	67	775
4 Health district 3.....	2,768	2,477	269	22	415	3,183
5 Health district 4.....	733	718	0	15	70	803
6 Health district 5.....	541	492	46	3	39	580
7 Health district 6.....	344	344	0	0	24	368
8 Health district 7.....	600	568	23	9	53	653
9 Health district 8.....	124	122	0	2	11	135
NUMBER PER DAY PER 100,000 CHILDREN						
10 Whole State.....	645.8	604.2	35.6	6.0	74.1	719.9
11 Health district 1.....	426.0	418.8	—	7.2	37.2	463.2
12 Health district 2.....	678.4	673.6	4.8	—	64.2	742.6
13 Health district 3.....	788.1	705.2	76.6	6.3	118.1	906.2
14 Health district 4.....	550.8	539.5	—	11.3	52.6	603.4
15 Health district 5.....	628.4	571.5	53.4	3.5	45.3	673.7
16 Health district 6.....	485.7	485.7	—	—	33.9	519.6
17 Health district 7.....	641.3	607.1	24.6	9.6	56.6	697.9
18 Health district 8.....	428.8	421.9	—	6.9	38.0	466.8

¹ Col. (1) is based on 1-day records of dentists; column (5), on annual figures.² For services other than examinations.³ Column (1) plus column (5).

TABLE 5. PHYSICIANS AND DENTISTS IN PRIVATE PRACTICE, BY TYPE OF SPECIALTY IN EACH HEALTH DISTRICT IN MASSACHUSETTS; PHYSICIANS AS OF JULY 1946, DENTISTS AS OF JUNE 1946

Health district	Number of physicians										Number of dentists					
	Other specialists					Total					General practitioners*			Orthodontists		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1 Whole State	4781	2945	180	394	11	112	474	73	172	312	108	2624	2534	2	42	46
2 Health District 1	367	261	9	15	0	4	27	7	14	25	5	176	172	0	2	2
3 Health District 2	405	325	9	16	1	1	22	0	7	15	9	263	258	0	2	3
4 Health District 3	2238	1139	106	265	7	80	275	46	103	161	56	1255	1197	2	29	27
5 Health District 4	574	426	17	21	1	8	38	5	14	32	12	306	303	0	0	3
6 Health District 5	359	228	12	32	1	8	34	7	13	20	4	196	188	0	4	4
7 Health District 6	254	202	4	4	1	2	16	0	3	16	6	112	111	0	0	1
8 Health District 7	447	274	17	36	0	6	45	6	15	36	12	247	238	0	4	5
9 Health District 8	137	90	6	5	0	3	17	2	3	7	4	69	67	0	1	1

* Six physicians and 245 dentists in Massachusetts did not report whether they limited their practice to one specialty and were assumed to be general practitioners.

TABLE 6. VISITS PER DAY FOR SICK AND WELL CHILDREN BY GENERAL MEDICAL PRACTITIONERS, PEDIATRICIANS, AND OTHER SPECIALISTS, BY HEALTH DISTRICT IN MASSACHUSETTS

Health district	Number of visits by specified physicians						Percent of all visits made by specified physicians					Number of physi- cians, visits per 100,000 children		
	Total physicians		Pediatricians		Other specialists		General practitioners		Pediatricians		Other specialists			
	Total physicians	General practitioners	Pediatricians	Other specialists	Total physicians	General practitioners	Pediatricians	Other specialists	(7)	(8)	(9)			
TOTAL VISITS FOR SICK AND WELL CHILDREN														
1 Whole State	19,418	14,474	1,983	2,961	100.0	74.5	10.2	15.3	2012.6					
2 Health district 1 . . .	1,746	1,311	151	284	100.0	75.1	8.6	16.3				1805.5		
3 Health district 2 . . .	2,043	1,805	82	156	100.0	88.4	4.0	7.6				1957.5		
4 Health district 3 . . .	7,295	5,052	933	1,310	100.0	69.2	12.8	18.0				2076.9		
5 Health district 4 . . .	2,782	2,209	256	317	100.0	79.4	9.2	11.4				2090.5		
6 Health district 5 . . .	1,514	1,012	181	321	100.0	66.8	12.0	21.2				1758.6		
7 Health district 6 . . .	1,413	1,239	28	146	100.0	87.7	2.0	10.3				1995.1		
8 Health district 7 . . .	1,961	1,295	299	367	100.0	66.1	15.2	18.7				2096.0		
9 Health district 8 . . .	664	551	53	60	100.0	83.0	8.0	9.0				2296.1		
VISITS FOR SICK CHILDREN														
* 10 Whole State	12,600	9,487	769	2,344	100.0	75.3	6.1	18.6				1305.9		
11 Health district 1 . . .	1,117	861	70	186	100.0	77.0	6.3	16.7				1155.1		
12 Health district 2 . . .	1,216	1,034	28	154	100.0	85.0	2.3	12.7				1165.1		
13 Health district 3 . . .	4,695	3,268	339	1,088	100.0	69.6	7.2	23.2				1336.7		
14 Health district 4 . . .	1,890	1,486	122	282	100.0	78.6	6.5	14.9				1420.2		
15 Health district 5 . . .	1,000	703	61	236	100.0	70.3	6.1	23.6				1161.6		
16 Health district 6 . . .	1,009	852	11	146	100.0	84.4	1.1	14.5				1424.7		
17 Health district 7 . . .	1,206	895	119	192	100.0	74.2	9.9	15.9				1289.0		
18 Health district 8 . . .	467	388	19	60	100.0	83.1	4.1	12.8				1614.9		

TABLE 7. NUMBER OF HOSPITALS IN STUDY, ACCORDING TO TYPE, BY HEALTH DISTRICT IN MASSACHUSETTS

Health district	All hospitals	General		Hospitals that admit children and other adults (no maternity)		Hospitals that admit children		Special ³		
		Total	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 Whole State	186	151	128	7	4	3	9	139	140	35
2 Health district 1 . . .	19	16	14	0	0	0	2	14	16	3
3 Health district 2 . . .	19	14	13	0	1	0	0	14	13	5
4 Health district 3 . . .	66	53	38	5	3	2	5	46	45	13
5 Health district 4 . . .	27	22	21	0	0	1	0	21	22	5
6 Health district 5 . . .	15	14	14	0	0	0	0	14	14	1
7 Health district 6 . . .	16	13	13	0	0	0	0	13	13	3
8 Health district 7 . . .	18	13	9	2	0	0	0	11	11	5
9 Health district 8 . . .	6	6	6	0	0	0	0	6	6	0

¹ Sum of cols. (3), (4) and (5).² Sum of cols. (3), (6) and (7).³ Includes 6 hospitals with contagious disease units.

See Table 34. Includes some units of general hospitals that reported separately.

TABLE 8. HOSPITAL FACILITIES AND SERVICES FOR NEWBORN, BY HEALTH DISTRICT IN MASSACHUSETTS

Health district	Facilities			Newborn during one year		
	Number of hospitals	Number of beds	Number of bassinets	Number of incubators ¹	Days of care	
					Number of birth during one year	Total number
1 Whole State.....	151	17,545	3,774	304	79,903	750,215
2 Health district 1.....	16	1,378	329	36	8,206	64,874
3 Health district 2.....	14	1,176	294	21	6,516	60,196
4 Health district 3.....	53	8,345	1,650	106	33,240	315,234
5 Health district 4.....	22	1,963	462	36	9,335	77,647
6 Health district 5.....	14	1,467	318	32	6,768	65,576
7 Health district 6.....	13	1,106	254	28	5,297	53,985
8 Health district 7.....	13	1,543	332	31	8,508	88,315
9 Health district 8.....	6	567	135	14	2,033	24,388

¹ Tabulated as zero for 21 hospitals not reporting.² Col. (6) divided by col. (5).

TABLE 9. OUTPATIENT SERVICES FOR CHILDREN, BY HEALTH DISTRICT IN MASSACHUSETTS

	Whole state	Health district 1	Health district 2	Health district 3	Health district 4	Health district 5	Health district 6	Health district 7	Health district 8
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1 Number of outpatient departments admitting children, total	45	4	1	21	8	2	4	3	2
2 Connected with hospitals ¹	42	4	1	18	8	2	4	3	2
3 5-24 beds	1	0	0	0	1	0	0	0	0
4 25-99 beds	7	1	0	3	2	0	0	0	1
5 100 or more beds	34	3	1	15	5	2	4	3	1
6 Independent medical clinics	3	0	0	3	0	0	0	0	0
7 Number with separate pediatric clinics	25	3	0	14	2	2	1	2	1
8 Number reporting specified types of service in separate pediatric clinics	23	3	0	14	1	1	1	2	1
9 Allergy	7	1	0	5	0	0	0	0	1
10 Cardiology	10	1	0	8	0	0	0	0	1
11 Mental hygiene	7	0	0	4	0	0	1	2	0
12 Luetic	5	0	0	4	0	0	0	1	0
13 Neurology	5	1	0	4	0	0	0	0	0
14 Surgery	10	1	0	6	0	0	1	1	1
15 Eye	8	1	0	5	0	0	0	1	1
16 Ear, nose, throat	10	1	0	6	0	0	0	2	1
17 Orthopedic	10	2	0	5	0	0	0	2	1
18 Dentistry	6	1	0	3	0	0	0	0	0
19 Number of pediatric clinics reporting visits*									
20 Visits to pediatric clinics during one year*									
21 Total visits during one year by children to outpatient departments ²	108337	1308	85	95194	3230	2598	3819	1884	219

¹ In non-proprietary general hospitals.² When total visits by children not reported they were assumed to be equal to visits to pediatric clinics. If neither figure was reported, total visits by children were estimated as 10% of total visits to outpatient department.

* Question not included in form used in Massachusetts.

TABLE 10. PATIENTS AND VISITS TO MEDICAL WELL-CHILD CONFERENCES DURING ONE YEAR, BY
HEALTH DISTRICT IN MASSACHUSETTS

Health district	Agency	Number of patients				Number of visits				Number per 1,000 children under 5				Number of visits per patient			
		Total	Infants	Preschool	Not re-enrolled separately	Total	Infants	Preschool	Not re-enrolled separately	Total	Infants	Preschool	Not re-enrolled separately	Total	Infants	Preschool	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)					
1 Whole State.....	All	51,816	11,903	14,933	24,980	147,640	36,549	31,621	79,470	138.2	393.7	2.8					
2	Official	31,467	6,279	8,749	16,439	92,081	22,155	18,641	51,285	83.9	245.6	2.9					
3	Voluntary	20,349	5,624	6,184	8,541	55,559	14,394	12,980	28,185	54.3	148.1	2.7					
4 Health district 1..	All	4,767	744	631	3,392	11,579	2,884	674	8,021	128.4	311.8	2.4					
5	Official	1,032	447	539	46	2,968	2,383	539	46	27.8	79.9	5.3	1.0				
6	Voluntary	3,735	297	92	3,346	8,611	501	135	7,975	100.6	231.9	2.3					
7 Health district 2..	All	9,239	4,633	4,227	379	30,730	18,149	11,823	758	230.8	767.5	3.3					
8	Official	4,770	2,503	2,267	0	21,942	13,915	8,027	0	119.2	348.0	4.6	3.5				
9	Voluntary	4,469	2,130	1,960	379	8,788	4,234	3,796	758	111.6	219.5	4.0	2.0				
10 Health district 3..	All	21,412	2,722	4,006	14,684	64,001	5,884	8,347	49,770	151.5	452.8	3.0					
11	Official	18,106	1,378	2,436	14,292	53,551	1,557	3,450	48,544	128.1	378.9	3.0					
12	Voluntary	3,306	1,344	1,570	10	4,650	4,327	4,897	1,226	23.4	73.9	3.2					
13 Health district 4..	All	3,595	651	560	2,384	5,652	1,272	785	3,955	72.5	114.0	1.6					
14	Official	1,603	361	379	863	1,864	416	452	996	32.3	37.6	1.2					
15	Voluntary	1,992	290	181	1,521	3,788	856	333	2,599	40.2	76.4	1.9					
16 Health district 5..	All	2,236	1,165	951	120	4,546	3,105	1,321	120	67.7	137.7	2.0	2.7				
17	Official	419	419	45	120	513	99	294	120	12.7	15.5	1.2					
18	Voluntary	1,817	1,120	697	0	4,033	3,006	1,027	0	55.0	122.2	2.2	2.7				
19 Health district 6..	All	3,257	66	480	2,711	16,118	119	624	15,375	121.2	599.8	4.9					
20	Official	1,403	66	480	857	1,811	119	624	1,068	67.4	174.2	52.2					
21	Voluntary	1,854	0	1,854	14,307	0	0	14,307	69.0	532.4	7.7						
22 Health district 7..	All	6,574	1,621	3,869	1,084	13,474	4,308	7,626	1,540	181.3	371.6	2.0					
23	Official	3,686	1,185	2,240	261	8,245	2,845	4,889	511	101.7	227.4	2.2	2.4				
24	Voluntary	2,888	436	1,629	823	5,229	1,463	2,737	1,029	79.6	144.2	1.8					
25 Health district 8..	All	736	301	209	226	1,540	828	421	291	67.9	142.1	2.1					
26	Official	448	294	154	0	1,187	821	366	0	41.3	109.5	2.6	2.4				
27	Voluntary	288	7	55	226	3,533	7	55	291	26.6	32.6	1.2					

¹ Computed only when age group is reported separately for at least 90% of total patients.

TABLE 11. IMMUNIZATIONS GIVEN ROUTINELY IN MEDICAL WELL-CHILD CONFERENCES DURING ONE YEAR, BY HEALTH DISTRICT IN MASSACHUSETTS

Health district	Agency	Smallpox			Diphtheria			Whooping cough			Tetanus		
		Children immunized		Total patients ¹									
		Total patients ¹	Number		Total patients ¹	Number		Total patients ¹	Number		Total patients ¹	Number	
1 Whole State	All	11105	5229	47.1	10700	3128	29.2	9561	2716	28.4	1346	282	21.0
2	Official	5592	4534	81.1	7392	2490	33.7	5432	2047	37.7	32	2	6.3
3	Voluntary	5513	695	12.6	3308	638	19.3	4129	669	16.2	1314	280	21.3
4 Health district 1 . . .	All	118	9	7.6	118	18	15.3	118	20	16.9	118	2	1.7
5	Official	0	0	—	0	0	—	0	0	—	0	0	—
6	Voluntary	118	9	7.6	118	18	15.3	118	20	16.9	118	2	1.7
7 Health district 2 . . .	All	2358	138	5.9	1108	452	40.8	0	0	—	0	0	—
8	Official	0	0	—	1108	452	40.8	0	0	—	0	0	—
9	Voluntary	2358	138	5.9	0	0	—	0	0	—	0	0	—
10 Health district 3 . . .	All	6667	4836	72.5	6882	1954	28.5	6065	2364	39.0	1228	280	22.8
11	Official	5471	4498	82.2	5503	1604	29.1	5312	2004	37.7	32	2	6.3
12	Voluntary	1196	338	28.3	1349	350	25.9	753	360	47.8	1196	278	23.2
13 Health district 4 . . .	All	0	0	—	0	0	—	0	0	—	0	0	—
14	Official	0	0	—	0	0	—	0	0	—	0	0	—
15	Voluntary	0	0	—	0	0	—	0	0	—	0	0	—
16 Health district 5 . . .	All	0	0	—	0	0	—	0	0	—	0	0	—
17	Official	0	0	—	0	0	—	0	0	—	0	0	—
18	Voluntary	0	0	—	0	0	—	0	0	—	0	0	—
19 Health district 6 . . .	All	121	36	29.8	139	46	33.1	1500	25	1.7	0	0	—
20	Official	121	36	29.8	139	46	33.1	0	0	—	0	0	—
21	Voluntary	0	0	—	0	0	—	1500	25	1.7	0	0	—
22 Health district 7 . . .	All	1758	178	10.1	1952	317	16.2	1878	307	16.3	0	0	—
23	Official	0	0	—	194	68	35.1	120	43	35.8	0	0	—
24	Voluntary	1758	178	10.1	1758	249	14.2	1758	264	16.0	0	0	—
25 Health district 8 . . .	All	83	32	38.6	531	341	64.2	0	0	—	0	0	—
26	Official	0	0	—	448	320	71.4	0	0	—	0	0	—
27	Voluntary	83	32	38.6	83	21	25.3	0	0	—	0	0	—

¹ Patients in conferences in which specified immunization is performed routinely and number immunized is known.

TABLE 12. STAFF OF MEDICAL WELL-CHILD CONFERENCES, BY HEALTH DISTRICT IN MASSACHUSETTS

Health district	Agency	Sessions during one year with specified type of physician in attendance										Average pay per session for part-time paid physicians			
		Number of sessions ¹					Percent								
		Pediatrician		General practitioner			Pediatrician ²		General practitioner ³			Pediatrician ⁴		General practitioner ⁵	
		Total	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1 Whole State	All	8016	1571	3298	104	0	2685	358	0	19.6	42.4	38.0	\$7.04	\$6.63	
2	Official	5487	1496	2294	0	0	1576	121	0	27.3	41.8	30.9	5.45	6.92	
3	Voluntary	2529	75	1004	104	0	1109	237	0	3.0	43.8	53.2	12.48	6.26	
4 Health district 1 . . .	All	722	72	47	0	0	603	0	0	10.0	6.5	83.5	34.89	6.12	
5	Official	324	72	2	0	0	250	0	0	22.2	0.6	77.2	27.50	—	
6	Voluntary	398	0	45	0	0	353	0	0	—	11.3	88.7	35.22	6.12	
7 Health district 2 . . .	All	1128	409	563	0	0	122	34	0	36.3	49.9	13.8	13.34	6.31	
8	Official	819	401	291	0	0	122	5	0	49.0	35.5	15.5	10.84	6.31	
9	Voluntary	309	8	272	0	0	0	29	0	2.6	88.0	9.4	19.38	—	
10 Health district 3 . . .	All	3660	886	1924	0	0	734	116	0	24.2	52.6	23.2	4.30	7.73	
11	Official	3105	834	1643	0	0	512	116	0	26.9	52.9	20.2	4.05	7.84	
12	Voluntary	555	52	281	0	0	222	0	0	9.4	50.6	40.0	12.50	7.41	
13 Health district 4 . . .	All	503	77	177	0	0	249	0	0	15.3	35.2	49.5	12.55	8.23	
14	Official	229	77	49	0	0	103	0	0	33.6	21.4	45.0	9.71	9.06	
15	Voluntary	274	0	128	0	0	146	0	0	—	46.7	53.3	13.67	7.78	
16 Health district 5 . . .	All	424	40	106	0	0	278	0	0	9.4	25.0	65.6	4.79	4.19	
17	Official	61	30	4	0	0	27	0	0	49.1	6.6	44.3	25.00	4.63	
18	Voluntary	363	10	102	0	0	251	0	0	0.28	28.1	69.1	4.00	4.14	

See footnotes on last page

TABLE 12. STAFF OF MEDICAL WELL-BORN CONFERENCES, BY HEALTH DISTRICT IN MASSACHUSETTS—Continued

Health district	Agency	Sessions during one year with specified type of physician in attendance										Average pay per session for part-time paid physicians	
		Number of sessions ¹		Percent									
		Total	Pediatrician	General Practitioner			Pediatricians ²			General Practitioners ³			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
19	Health district 6...	All	349	74	100	0	0	175	0	0	21.2	28.7	
20		Official	183	74	0	0	109	0	0	40.4	—	59.6	
21		Voluntary	166	0	100	0	66	0	0	—	60.2	39.8	
22	Health district 7...	All	1049	13	206	104	0	518	208	0	1.2	29.6	
23		Official	598	8	137	0	0	453	0	0	1.3	22.9	
24		Voluntary	451	5	69	104	0	65	208	0	1.1	38.4	
25	Health district 8...	All	181	0	175	0	0	6	0	0	—	96.7	
26		Official	168	0	168	0	0	0	0	0	—	100.0	
27		Voluntary	13	0	7	0	0	6	0	0	—	53.8	

¹ Each session is counted once for each physician in attendance. Col. (1) is sum of cols. (2)–(8).

² Includes health officers, all full-time paid physicians and hospital house staff.

³ Col. (10) is sum of cols. (3), (4) and (5) divided by col. (1). Similar procedure for col. (11).

Note: Usual time per session was two or more hours for 74 percent of the sessions reporting this item.

TABLE 13. PRACTICES IN MEDICAL WELL-CHILD CONFERENCES, BY HEALTH DISTRICT IN MASSACHUSETTS

Health district	Agency	Routine immunizations				Public health nursing follow-up in the home				Other services						
		Sessions giving service		Sessions giving service		Sessions giving service		Sessions giving service		Consultant service ² by:		Other services				
		Smallpox and diphtheria	Whooping cough	Number	Percent	Number	Percent	Number	Percent	Nutritionist	Number	Percent	Number			
1 Whole State	All	6,527	2,141	32.8	2,121	32.5	7,259	7,234	99.7	7,259	5,937	81.8	4,463	61.5	1,445	19.9
2	Official	3,967	1,668	42.0	1,608	40.5	4,631	4,617	99.7	4,632	3,956	85.4	3,451	74.5	1,063	22.9
3	Voluntary	2,560	473	18.5	513	20.0	2,628	2,617	99.6	2,627	1,981	75.4	1,012	38.5	382	14.5
4 Health district 1	All	602	30	5.0	30	5.0	682	671	98.4	682	680	99.7	390	57.2	322	47.2
5	Official	256	0	—	0	—	324	324	100.0	324	322	99.4	323	99.7	322	99.4
6	Voluntary	346	30	8.7	30	8.7	358	347	96.9	358	358	100.0	67	18.7	0	—
7 Health district 2	All	1,151	0	—	0	—	1,151	1,151	100.0	1,151	390	33.9	1,095	95.1	85	7.4
8	Official	825	0	—	0	—	825	825	100.0	825	382	46.3	769	93.2	77	9.3
9	Voluntary	326	0	—	0	—	326	326	100.0	326	8	2.5	326	100.0	8	2.5
10 Health district 3	All	2,603	1,878	72.1	1,744	67.0	3,030	3,030	100.0	3,030	2,564	84.6	2,002	66.1	350	11.6
11	Official	1,867	1,647	88.2	1,569	84.0	2,283	2,283	100.0	2,283	2,087	91.4	1,645	72.1	85	3.7
12	Voluntary	736	231	31.4	175	23.8	747	747	100.0	747	477	63.9	357	47.8	265	35.5
13 Health district 4	All	529	0	—	0	—	517	505	97.7	517	439	84.9	108	20.9	29	5.6
14	Official	203	0	—	0	—	191	179	93.7	191	169	88.5	86	45.0	29	15.2
15	Voluntary	326	0	—	0	—	326	326	100.0	326	270	82.8	22	6.7	0	—

¹ Advice on formulae, feeding care and training.² Consultant service for staff and/or parents.

TABLE 13. PRACTICES IN MEDICAL WELL-CHILD CONFERENCES, BY HEALTH DISTRICT IN MASSACHUSETTS—Continued

Health district	Agency	Routine immunizations		Public health nursing follow-up in the home		Other services		Sessions giving service ²		Sessions giving service ²		Psychologist or psychiatrist				
		Sessions giving service		Sessions giving service		Advice to mothers ¹		Nutritionist		Nutritionist		Number				
		Smallpox and diphtheria	Whooping cough	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent			
16	Health district 5...	All	403	0	—	446	100.0	446	43.7	98.0	42	9.4	38	8.5		
17		Official	26	0	—	69	100.0	69	60	87.0	42	60.9	38	55.1		
18		Voluntary	377	0	—	377	100.0	377	37.7	100.0	0	—	0	—		
19	Health district 6...	All	241	87	100	41.5	316	100.0	316	98.7	196	62.0	96	30.4		
20		Official	108	21	19.4	0	183	100.0	183	97.8	96	52.5	96	52.5		
21		Voluntary	133	0	—	100	75.2	133	100.0	133	100.0	100	75.2	0	—	
22	Health district 7...	All	822	208	25.3	247	30.0	935	99.8	936	61.7	65.9	521	55.7		
23		Official	514	0	—	39	7.6	588	99.7	589	100.0	490	83.2	416	70.6	
24		Voluntary	308	208	67.5	208	67.5	347	100.0	347	100.0	127	36.6	105	30.3	
25	Health district 8...	All	176	4	2.3	0	—	182	100.0	181	17.9	98.9	13	7.2	2.2	
26		Official	168	0	—	0	—	168	100.0	168	100.0	0	—	0	—	
27		Voluntary	8	4	50.0	0	—	14	14	100.0	13	84.6	13	100.0	4	30.8

¹ Advice on formulae, feeding care and training.² Consultant service for staff and/or parents.

TABLE 14. PATIENTS AND VISITS TO CHILDREN'S DENTAL CLINICS DURING ONE YEAR, BY HEALTH DISTRICT IN MASSACHUSETTS

Health district	Agency	Number of patients ¹						Number of visits ¹			
		Number of dentist-hours		Preschool		School		Preschool		School	
		Total	Total	Preschool	School	Total	Preschool	Total	Preschool	Total	Preschool
1 Whole State	All	116933	121156	2734	97719	20703	8451	192389	60190	363930	9696
2	Official	87869	107749	1884	94703	111632	217108	4739	29280	278432	85498
3	Voluntary	29064	13407	850	3016	9541	43922	3712	9300	30910	85498
4 Health district 1 . . .	All	2764	5016	0	3445	1571	13224	0	9822	3402	9896
5	Official	2734	4960	0	3389	1571	13161	0	9759	3402	9695
6	Voluntary	30	56	0	56	0	63	0	63	0	201
7 Health district 2 . . .	All	6107	10616	402	10117	97	24592	1625	22713	254	44864
8	Official	5656	9551	402	9052	97	22770	1625	20891	254	41842
9	Voluntary	451	1065	0	1065	0	1822	0	1822	0	3022
10 Health district 3 . . .	All	81281	65687	1593	51031	13063	151057	4000	106933	40104	224767
11	Official	55732	56477	1401	49806	5270	119255	2830	101562	14863	148632
12	Voluntary	25549	9210	192	1225	7793	31802	1170	5391	22241	76145
13 Health district 4 . . .	All	10244	14694	0	11858	2836	25660	0	18576	7084	38753
14	Official	9286	13552	0	11516	2036	23191	0	17307	5884	35384
15	Voluntary	958	1142	0	342	800	2469	0	1269	1200	3369
16 Health district 5 . . .	All	3895	7948	10	6216	1722	14097	10	10769	3318	10575
17	Official	3608	7557	10	6216	1331	13199	10	10769	2420	9949
18	Voluntary	287	391	0	0	391	895	0	0	898	626
19 Health district 6 . . .	All	4882	6299	0	6299	0	8889	0	8889	0	6900
20	Official	4648	6199	0	6199	0	8702	0	8702	0	6640
21	Voluntary	234	100	0	100	0	187	0	187	0	260
22 Health district 7 . . .	All	6917	9661	0	8395	1266	19479	0	13957	5522	21104
23	Official	5926	9167	0	8395	772	15989	0	13957	2032	20610
24	Voluntary	991	494	0	0	494	3490	0	0	3490	494
25 Health district 8 . . .	All	843	1235	729	358	148	4032	2816	710	506	7071
26	Official	279	286	71	130	85	841	274	142	425	5690
27	Voluntary	564	949	658	228	63	3191	2542	568	81	1381

¹ For services other than examinations.

TABLE 15. RATES OF CARE IN CHILDREN'S DENTAL CLINICS DURING ONE YEAR, BY HEALTH DISTRICT IN MASSACHUSETTS¹

Health district	Agency	Number per 1,000 children				Number of visits per patient	Ratio of dental examinations to patients given service ²
		Dentist-hours	Patients	Visits	Examinations		
(1)	(2)	(3)	(4)	(5)	(6)		
1 Whole State	All	121.2	125.6	270.6	377.2	2.2	3.0
2	Official	91.1	111.7	225.1	288.6	2.0	2.6
3	Voluntary	30.1	13.9	45.5	88.6	3.3	6.4
4 Health district 1	All	28.6	51.9	136.7	102.3	2.6	2.0
5	Official	28.3	51.3	136.0	100.2	2.7	2.0
6	Voluntary	0.3	0.6	0.7	2.1	1.1	3.6
7 Health district 2	All	58.5	101.7	235.6	429.9	2.3	4.2
8	Official	54.2	91.5	218.1	400.9	2.4	4.4
9	Voluntary	4.3	10.2	17.5	29.0	1.7	2.8
10 Health district 3	All	231.4	187.0	430.1	639.9	2.3	3.4
11	Official	158.7	160.8	339.6	423.1	2.1	2.6
12	Voluntary	72.7	26.2	90.5	216.8	3.5	8.3
13 Health district 4	All	77.0	110.4	192.8	291.2	1.7	2.6
14	Official	69.8	101.8	174.2	265.9	1.7	2.6
15	Voluntary	7.2	8.6	18.6	25.3	2.2	3.0
16 Health district 5	All	45.2	92.3	163.7	122.8	1.8	1.3
17	Official	41.9	87.8	153.3	115.5	1.7	1.3
18	Voluntary	3.3	4.5	10.4	7.3	2.3	1.6
19 Health district 6	All	68.9	88.9	125.5	97.4	1.4	1.1
20	Official	65.6	87.5	122.9	93.7	1.4	1.1
21	Voluntary	3.3	1.4	2.6	3.7	1.9	2.6
22 Health district 7	All	73.9	103.3	208.2	225.6	2.0	2.2
23	Official	63.3	98.0	170.9	220.3	1.7	2.2
24	Voluntary	10.6	5.3	37.3	5.3	7.1	1.0
25 Health district 8	All	29.2	42.7	139.4	244.5	3.3	5.7
26	Official	9.6	9.9	29.1	196.7	2.9	19.9
27	Voluntary	19.6	32.8	110.3	47.8	3.4	1.5

¹ Based on Table 14.² Table 14, col. (10) divided by col. (2).

TABLE 16. MENTAL HYGIENE SERVICES¹ FOR CHILDREN DURING ONE YEAR IN MASSACHUSETTS

	All agencies (1)	Official agencies (2)	Voluntary agencies (3)
1 Number of patients.....	5,158	3,419	1,739
2 Number of visits.....	20,373	12,968	7,405
3 Number of visits to clinics reporting days of clinic service.....	19,953	12,968	6,985
4 Number of days of clinic service.....	1,366	872	494
5 Number of visits to clinics			
6 Reporting on staff.....	20,373	12,968	7,405
7 With full-time psychiatrist on staff.....	12,658	7,608	5,050
8 With complete staff service ²	20,373	12,968	7,405

¹ At clinics served by psychiatrists, psychologists and/or pediatricians.² Psychiatrist, psychologist and social worker employed full or part-time.

Visits by county group

Metropolitan and adjacent counties.....	20293
Isolated counties.....	80

TABLE 17. SERVICES¹ FOR PHYSICALLY-HANDICAPPED CHILDREN DURING ONE YEAR IN MASSACHUSETTS

	All agencies (1)	Official agencies (2)	Voluntary agencies (3)
1 Number of patients.....	2,415	2,415	0
2 Number of visits.....	3,533	3,533	0
3 Number of visits to clinics reporting number of sessions.....	3,533	3,533	0
4 Number of sessions.....	325	325	0
5 Number of visits to clinics			
6 Reporting on staff.....	3,533	3,533	0
7 With pediatrician on staff.....	0	0	0
8 With nursing staff.....	3,533	3,533	0
9 With auxiliary staff ²	2,786	2,786	0

¹ At clinics served by medical staff.² Physiotherapist, social worker or other professional staff (exclusive of physicians and nurses) employed full or part-time.

TABLE 18. STAFF ENGAGED IN SCHOOL HEALTH SERVICES, BY COUNTY GROUP IN MASSACHUSETTS

County group	MEDICAL STAFF ¹						NURSING STAFF					
	Number of school physicians ³			Employed by			Number employed by			Nursing staff		
	Specialty	General practitioners	Other health specialists	Joint official health agencies	Other health agencies							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1 Whole State.....	0	602	536	47	19	115	444	39	4	552	118	393
2 Greater metropolitan.....	0	329	298	15	16	55	242	31	1	300	52	214
3 Lesser metropolitan.....	0	184	154	27	3	53	124	7	0	182	58	120
4 Adjacent.....	0	66	61	5	0	6	58	1	1	48	7	39
5 Isolated semi-rural.....	0	17	17	0	0	0	15	0	2	16	0	15
6 Isolated rural.....	0	6	6	0	0	1	5	0	0	6	1	5

¹ Medical staff included only when medical examinations are done on (1) all pupils once a year, (2) certain grades once a year, or (3) referrals by teachers or nurses.

² A health officer may be counted more than once if he serves more than one agency. Includes physicians working full or part-time in schools.

³ A school physician may be counted more than once if he serves more than one agency.

⁴ Joint official health and education agencies operating a joint or cooperative program.

⁵ Other agencies include voluntary agencies and official agencies other than health and education.

⁶ If a nurse serves more than one county, considered only in county of her headquarters. This is an unduplicated count of nurses working full or part-time in schools.

TABLE 19. SERVICE FOR CHILDREN PROVIDED BY OFFICIAL AND VOLUNTARY PUBLIC HEALTH NURSING AGENCIES DURING ONE YEAR, BY HEALTH DISTRICT IN MASSACHUSETTS

Health district	Nursing staff ¹		Nurses with preparation in an approved program of public health nursing		Home visits to children		Number of towns, by type of nursing service	
	Full-time paid nurses	Number of nurses	Number per 100,000 children	Number per 100,000 children	Number with one year or less than one year completed one academic year	Number with one year or less than one year	Number per 1,000 children	Number per 1,000 children
1 Whole State	938	883	91.5	854	168	686	530,155	549.5
2 Health district 1	89	78	80.7	71	7	64	76,995	796.2
3 Health district 2	94	89	85.3	94	28	66	48,861	468.2
4 Health district 3	352	344	97.9	301	82	219	188,222	535.9
5 Health district 4	106	99	74.4	104	12	92	33,454	241
6 Health district 5	110	100	116.2	110	11	99	67,757	787.0
7 Health district 6	59	52	73.4	59	12	47	23,365	329.9
8 Health district 7	97	90	96.2	94	16	78	60,945	651.4
9 Health district 8	31	31	107.2	21	0	21	30,556	1056.6

¹ Exclusive of nurses employed by agencies giving only school health, industrial, tuberculosis, or venereal disease services; exclusive of nurses reported as supervisors employed by state agencies. If a nurse serves more than one district, considered only in district of her headquarters. This is an unduplicated count.

² Assistance in well-child clinics, home visits for health supervision, bedside nursing care and school services.

APPENDIX C—GLOSSARY

GLOSSARY

Children: When an upper age limit is required for the purposes of statistical tabulation, the limit has been set at the age of 15 years in order to correspond with currently available population data. The term children includes newborn infants unless otherwise stated.

Contagious Disease Unit: Ten or more beds set aside for communicable disease in general hospitals with 100 or more beds.

General Hospital Beds: Beds in general, maternity and pediatric hospitals, both those registered by the American Medical Association and those unregistered, provided that they: (a) report 5 or more beds and (b) admit at least 10 children or 10 obstetrical cases annually. Beds in general hospitals operated by the Bureau of Indian Affairs are included on the assumption that they represent facilities operated on a local area basis, but other Federal hospitals are excluded. Also in the excluded group are maternity nursing homes; hospitals in jails, prisons and reformatories; school hospitals and infirmaries; and health camps.

Health Supervision: Service to well children for supervision and guidance of growth and development, feeding, and the usual problems of emotional and social development. Includes periodic examinations and immunizations. The service may be provided by physicians in private practice or by community health agencies.

Medical Well-Child Conference: A clinic operated by a health agency offering to children preventive medical services under the direction of a physician, including immunizations, routine health examinations, advice on feeding, and other care designed to maintain the health of well children.

Newborn Infant: An infant less than one month of age.

Pediatrician: A physician who states that he limits his practice to pediatrics, provided that not more than 20 per cent of his four-week record of visits are for patients over 15 years of age.

Pediatric Unit: Five or more beds permanently set aside for the care of children in hospitals with 25 or more total beds.

Premature Infant: An infant whose birth weight is 2,500 grams or less (5 pounds, 8 ounces).

Specialist: A physician or dentist who reports that he limits his practice to a recognized specialty.

Special Hospital Beds: Beds in special hospitals, registered or unregistered by the American Medical Association, provided that these hospitals: (a) report 5 or more beds, and (b) treat or admit at least 10 children, or report at least 1,000 days of child care annually. Included are beds in the following hospitals: mental; tuberculosis; convalescent and chronic; contagious disease; orthopedic; eye, ear, nose and throat; and institutions for feebleminded.

Well-Child Visit: Visits for health supervision by general practitioners, pediatricians, internists, and obstetricians.

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